

Brockton Area Transit Study

Technical Memorandum #1

ANALYSIS OF PAST AND PRESENT SERVICE

February 4, 1975

Analysis of Past and Present Service

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Introduction

This first technical memorandum documents much of the initial data collected as part of the Brockton Area Transit Study, however, it does not present data collected as part of the surveys. For example, ridership statistics are found in Technical Memorandum No. 2 and financial statistics can be found in Technical Memorandum No. 3 .

The purpose of this document is to present the data collected and developed other than through the surveys conducted.

Socio-Economic Data

It is a well-known fact that the demand for bus service is directly related to a variety of population/socio-economic characteristics. Many of the variables that can be analyzed to determine the need for bus service are available through the Bureau of the Census-published information. This data was collected during the 1970 Census. Table 1 shows a comparison of 1970 Census population statistics by town and the estimated 1974 population. As part of this effort, it was concluded that the growth between 1970 and 1974 was not so significant as to disqualify the utilization of the more specific 1970 Census information.

The region, in effect, has two traffic zone systems. The first set of zones were utilized in the development of Census Journey-to-Work data by the Massachusetts Department of Public Works. The second set of zones are referred to as the Basic Analysis Zones (BAZ) and were developed by the Old Colony Planning Region as part of its comprehensive transportation planning effort. In effect, the BAZ's are subdivisions of the "Journey-to-Work" zones. The socio-economic data which appears in Appendix 1 (data by Journey-to-Work zone) and Appendix 2 (socio-economic statistics) were developed the Journey-to-Work zones in that much of the socio-economic data desired for the analysis was not available at a detailed BAZ level, but did exist at the Journey-to-Work zone level. On the other hand, all of the trip information collected as part of the surveys was coded to the BAZ system. That data will therefore be aggregated to the Journey-to-Work zone system. In that future transportation planning in the region will be conducted at the BAZ level, the survey data already meets the requirements.

The socio-economic data developed at the Journey-to-Work level and found in the appendices includes total population, population over 65 (i.e., elderly), all developed on a per square mile basis, and median income, and number of families below the 1970 poverty level. In addition, employment statistics by Journey-to-Work zone which are found in Appendix 3, and employment per square mile were made

Table 1
Population in 1970 and 1974

	<u>1970</u>	<u>1974¹</u>
Abington	12349	14276
Avon	5280	5473
Bridgewater	11829	15921
Brockton	89040	98640
East Bridgewater	8347	9422
Easton	12157	14879
Hanson	7148	7690
Pembroke	11193	12535
West Bridgewater	7152	7622
Whitman	<u>13018</u>	<u>13859</u>
	177513	200317
Halifax	3468	NA
Stoughton	<u>23429</u>	NA
	204410	

1 Estimates made using housing permits

available through the Census Journey-to-Work statistics. All of these data will be used to determine the need for improved transit service, not only from the point of view of providing service to the underprivileged such as low income areas and the elderly, but also to determine the need for improving service to these areas with a variety of population concentrations, and further using employment statistics to determine those areas where bus service should be extended for employment opportunities and shopping and personal business needs.

Development of Socio-Economic Statistics

A composite map of the Old Colony Planning Region was prepared from county series maps scaled at 1" = 1/2 mile. The boundaries of the two main zone systems for which data is available (the Journey-to-Work Zones - JW Zones - and the Basic Analysis Zones - BAZs -) were transferred onto the composite. Overlays displaying socio-economic information available at the JW Zone and BAZ level and pertinent to the transit study were prepared for socio-economic information available at the town level. Samples of these displays include (by town) population, pop/mi², labor force, l.f./mi², autos, autos/1000 pop., pop. over 65. pop. over 65/1000 pop., minority pop., and minority pop./1000 pop.

To develop displays similar to the aforementioned but at the JW Zone and BAZ level, it was necessary to compute the square mile areas of the BAZ's. Since the JW Zones are aggregations of BAZ s, BAZ areas could then be aggregated to yield square mile totals for the JW Zones.

Procedure for Calculating Zone Areas

Initial area calculations were made using translucent graph paper (10 blocks = 1 inch therefore there are 100 square blocks to the square inch). By laying the graph paper over the zone, the number of blocks in the zone was determined. Estimations were made when adding portions of blocks, hence the possibility of human error. Subsequently, conversion factors of blocks² to square miles was determined.

$$1 \text{ inch} = 1/2 \text{ mile} \therefore 4 \text{ inch}^2 = 1 \text{ mile}^2$$

$$100 \text{ blocks}^2 = 1 \text{ inch}^2 \therefore 400 \text{ blocks}^2 = 1 \text{ mile}^2$$

A more accurate drafting method using a set of aerographs was used once the aerographs were located for use. A set of aerographs contains three trans-

parencies at three different scales. The graphs are 14" by 11" transparencies covered with rectangles containing ten dots each. Within the rectangles the dots are spaced at random. Similar in procedure to the square method, the transparency is overlaid on the zone and the number of dots within the zone is counted. For the overlay scale for Old Colony, the number of dots divided by 100 yielded the zone area in square inches. This was easily convertible to square miles. This scale is guaranteed 97% accurate for all zones greater than 12 square inches.

Since nearly all the BAZ areas calculated were less than 12 square inches, the degree of accuracy was reduced. As a check, BAZ areas were aggregated to the town level to compare with known town areas. On the twelve towns calculated (3 by squares method and 9 by aerograph), seven were within 2% of the town total, hence 98% accurate. The areas of the BAZ's in the five remaining towns were adjusted to yield aggregated areas within 2% of the town totals.

Procedure for Adjusting BAZ Areas

The percent error was calculated by dividing the "aggregated BAZ town total" by the "known town total". For those percentages outside the 2% limit, all individual BAZ areas were multiplied by the percent of error. This produced new town totals within 1.1% of the known area.

The BAZ areas in Brockton were checked at a later time using a planimeter. The areographs proved accurate within .01 square miles in nearly all cases. Necessary corrections in the reported data were made.

Census Data

The only statistical method of assigning information to the BAZ level without prorating information from a larger scaled zone system is to aggregate data available at block level in the Brockton, Mass. Urbanized Area Block Statistics.

This was successful for those towns for which block data is available except in Brockton. A problem was realized when it was discovered that while the Brockton town totals were correct for population and housing, the census tract totals and block totals were incorrect. Unfortunately the corrections list only indicates data corrections at the census tract level. Block data had to be prorated prior to being aggregated to the BAZ level.

In tract 5117, however, even the block data was obviously incorrect due to the number of blocks reporting zero population. To allow aggregation to the BAZ populations, the following procedure was used. The number of dwelling units per BAZ was calculated from the 1970 City Street Directory for Brockton. The corrected Tract population (minus those living at the VA Hospital in April 1970) was used to determine the number of persons per dwelling unit. This factor was applied to the BAZ dwelling unit totals to yield estimated population per BAZ. The 950 residents of the VA Hospital were assigned to the appropriate BAZ (Number 53).

Brockton Statistical Correction Factors

Statistical factors were calculated to prorate the block data. These factors were ratios obtained by dividing the correct statistic count by the incorrect data count at the tract level. As indicated, there are different correction factors for population counts than for housing units.

Brockton BAZ statistics were calculated by identifying which blocks comprise which zones, adding up the incorrect Census data for each block contained in the BAZ, and prorating this total number using the appropriate factor. Since BAZ's

are subdivisions of census tracts, only one factor was applicable to any one BAZ.

Socio-economic data was transferred from the Socio-Economic Data Form (previously compiled from the 1970 Census Planning Package at the JW Zone level) to the BATS statistics for BAZ tables.

Statistical categories included minority population, population over 65, median income, and number of families whose total income was less than \$6000. Also, statistical counts of families owning one, two, three, or more, or no autos was expanded to yield total numbers of autos owned. To do this, it was necessary to apply a factor representative of the average number of autos owned in the "three or more" category. By using actual statistics from the BATS Home Interview Survey, it was determined that the factor used should be 3.2. Thirty families interviewed owned three or more autos; twenty-five families owned exactly three autos - total of 75 autos. Three families owned four autos - total of 12 autos. Two families owned five autos - total of ten autos. The grand total was 97 autos owned by thirty families or an average of 3.2 cars per family.

The next step was to summarize the BAZ population totals to the JW Zone level to compare with the JW population statistics. Except in Brockton, the tables were quite close to being exact. Brockton JW Zone totals varied quite a bit in some cases, however. The ratio of the "aggregated BAZ population total to the JW Zone total" was calculated. This ratio factor was then applied to the data in other JW categories to improve the quality of the JW data. The factors appear in the heading of the tables. The only category not prorated was, of course, the median income for the zone which should be the same

regardless of variations in the population totals. This adjusted JW data was then aggregated to the town level.

Housing

In addition to quantifying and analyzing the Census population and housing data, the staff put together detailed data for elderly, veterans, and low and moderate income housing. This information is found in Table 2, and has been plotted on the land use maps developed for analysis.

Table 2

ELDERLY, VETERANS, AND LOW & MODERATE INCOME HOUSING

Abington

No.	Name	Type	# Units	Comments
AB1	Lincoln Boulevard	Elderly	40	
AB2	Shaw Avenue	Elderly	80	Proposed
AB3	Shaw Avenue	Low	10	Proposed

Avon

AV1	Fellowship Circle	Elderly & Handicapped	90	
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Bridgewater

B1	Hemlock Drive	Elderly	96	
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Brockton

B1	South Main High Rise	Elderly	400	
B2	Caffrey Towers	Elderly	318	
B3	Belair High Rise	Elderly	215	
B4	Sullivan Towers	Elderly	122	
B5	Kennedy Drive	Elderly	120	
B6	Manning Towers	Elderly	100	
B7	Belair Apartments	Elderly	100	
B8	Rainbow Terrace	Elderly	64	
B9	Golden Circle	Elderly	46	
B10	Crescent Court	L&M	124	
B11	Hillside Village	L&M	100	
B12	Roosevelt Heights	Veterans	124	
B13	Washburn Heights	Veterans	50	
B14	Battles Farm Village	L&M	320	25% Low - 50% Moderate
B15	Pine Grove I	L&M	114	25% Low - 75% Moderate
B16	Pine Grove II	L&M	288	25% Low - 75% Moderate
B17	Southfield Gardens	L&M	200	25% Low - 50% Moderate
B18	Chatham West I	L&M	300	25% Low - 47% Moderate
B19	Chatham West II	L&M	280	Under Construction
B20	Salisbury - Grove	Elderly	150	Proposed - 20% Low

East Bridgewater

EB1	Memorial Drive	Elderly	48	
EB2	Memorial Drive	Elderly	?	Proposed

ELDERLY, VETERANS, AND LOW & MODERATE INCOME HOUSING (CONT.)

Easton

No.	Name	Type	# Units	Comments
E1	Elsie Circle	Elderly	64	
E2	Elsie Circle	Elderly	80	Under Construction

Hanson

H1	Liberty Street	Elderly	?	
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Pembroke

P1	School Street Project	Elderly	56	
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West Bridgewater

WB1	Ester Street Project	Elderly	48	
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Whitman

W1	Stetson Terrace	Elderly	40	
W2	Harvard	Elderly	?	Proposed

Stoughton

S1	La Civita Court	Elderly	96	
S2	Veterans	Veterans	26	

PRESENT OPERATIONS

Present Operations

As mentioned earlier, many of the statistics concerning the present operations such as bus ridership, persons per bus mile, financial statistics, will be reported in Technical Memorandum #2 after the surveys have been completed and the analysis performed. The purpose of this section is to document that data collected without performing rather elaborate surveys.

Rolling Stock

Local bus service, that is, service which is primarily within the region, is provided by two transit operations. The largest is that service provided by the Crocker Transit System, Inc. That company operates 11 scheduled bus routes, 10 of which are within the limits of the City of Brockton, and financially supported by the City and State. The 11th route, which is the Brockton to Rockland and Abington route, is operated by Crocker with no financial support. In addition, the company operates short trippers such as two senior citizen runs a day, two senior citizen Saturday shopper runs, and a number of high school and junior high school trippers with Transportation Authority vehicles. Table 3 lists the rolling stock owned by the Transportation Authority and leased to the company for the operation of service financially supported by the City and State through the Brockton Transportation Authority.

A second company providing local transit service is the Interstate Coach Company. This company provides service from Easton to Brockton and Stoughton to Brockton, and is partially financed by the Town of Easton. The rolling stock used by this company may be found in Table 3. As is obvious from reviewing the age of the rolling stock used in providing service, this stock is beyond a reasonable ten to twelve year maximum life. For the service provided by Crocker, with the elimination of the two flexibles recently purchased by the City, the average age of the rolling stock is 16 years, and the average age of the Interstate Coach rolling stock is 11 years. Certainly a number of problems exist with such antiquated equipment. Certainly it is difficult to maintain a high degree of in-service time

because of equipment failures, therefore effecting the dependability of the operation. Further, the equipment is not attractive to the public, and to some extent, therefore, discourages ridership.

Buses owned by the Brockton Transportation Authority and leased to Crocker Transit Systems, Inc.

November 4, 1974

Leased Equipment

<u>Bus Number</u>	<u>Manufacturer</u>	<u>Year</u>	<u>Model</u>	<u>Serial Number</u>	<u>Number of Seats</u>
7401	Flxible	1974	572KE-F74-19	FX-614	23
7402	Flxible	1974	572KE-F74-19	FX-622	23
475	GMC	1962	TDH4517	1748	44
476	GMC	1962	TDH4517	1749	44
478	GMC	1962	TDH4517	1751	44
479	GMC	1962	TDH4517	1752	44
	GMC	1955	TDH5105	1290	51
	GMC	1955	TDH5105	1297	51
	GMC	1955	TDH5105	1298	51

Interstate Coach Company

The Interstate Coach Company operates service from Stoughton Center to Brockton Center through Westgate Mall and from Easton to Brockton. The Easton to Brockton run is subsidized by the Town of Easton. The company uses a fare box with a meter and records the fares when it crosses the Brockton-Easton town line in each direction. The company uses those passenger counts to bill the Town of Easton.

Interstate Coach uses locked, exact-fare boxes on the Stoughton run.

Garage Facilities

The company garage is located in Stoughton Center and contains eight bus bays. The bus bays are large enough to store one large coach or two 22-seat coaches. The garage is equipped with a repair pit.

Rolling Stock

The company runs only the two local routes previously mentioned. The rolling stock used in the operation is:

<u>Use</u>	<u>No.</u>	<u>Year</u>	<u>Make</u>	<u>Type</u>	<u>Seats</u>
Easton	1	1972	Carpenter	Gas	22
Stoughton	1	1973	GM Transit	Diesel	33
Backup	1	1961	GMC	Diesel	41
Backup	1	1951	GMC	Diesel	45

Designated Bus Stops

The present operation is a 'flag-down' method. That is, a passenger standing at the side of the road waves to the bus and the bus stops and picks up that individual. This type of operation implies a number of problems. First, in busy locations with cars parked along the side of the road, the driver often does not see the passenger. Second, the flag-down type of service encourages individuals to walk between parked cars to flag a bus, resulting in safety problems. Third, the average bus speed is reduced in that the drivers are stopping more often, although this is probably not a significant reason for discontinuing the flag-down system. Fourth, the lack of bus stop signs and bus stop areas does not provide the type of promotion and advertisement that bus stops and benches and shelters provide. That is, designated stops in a sense, is a form of promotion and advertising of bus service. Therefore, it is recommended that the system be converted to a fixed-stop system with bus stops marked with signs, pole markings, painted yellow curbs, and no parking signs in the vicinity of the bus stop. The actual locations of the bus stops must be studied in further detail with respect to traffic conditions.

Bus Destination Signs

All of the vehicles presently owned by the Transportation Authority contain roll-up bus destination signs for the existing system. The legends are numbered in accordance with the run numbers used by the Crocker Transportation Company. New signs cost approximately \$50. and should be purchased with new vehicles.

Window card destination signs have cost the operator approximately \$4. apiece on each side, and a number should be obtained for the unscheduled service that is often provided by the transportation authority.

Bus Service Support Equipment

When considering the development and improvement of local bus service, it is necessary to give a detailed consideration to that equipment needed to keep the rolling stock operating efficiently. Through discussions with the Brockton Transportation Authority and the president of Crocker Transportation Company, the operator for the transportation authority, the following needs and statistics have been ascertained:

Garage Facility

The present bus garage and storage facility is leased by Crocker for \$1500. per month. The garage is built with an inside truss roof with offices on the front of the facility (not leased by Crocker). The garage itself is 12,800 square feet, and will accommodate 15 large buses. The garage is used for repairs and cleaning and contains small vehicle floor lifts. The paved yard adjacent to the garage contains 16,000 square feet and will store 25 large buses. Crocker recently considered purchasing the entire facility for approximately \$300,000.

Maintenance Equipment

Cleaning

The operator has a engine steam cleaning machine and cleans the engines of all bus buses and the transportation authority buses about once a month, required because of all of the dirt that is accumulated from the operation. A new steam cleaning machine will cost approximately \$700.

The operator presently washes each bus about twice a week with a high-pressure hose washer and suggests that the transportation authority consider an indoor drive-through washer for approximately \$17,000.

The operator presently has a vacuum machine for the interiors of the vehicles and recommends that a new vacuum be purchased.

Bus Repair

The operator presently has three small-bus floor lifts and would prefer to have a pit for repairs, however by State statute, pits are illegal in his type

of operation. He recommends that two large-lus floor lifts be purchased and installed for approximately \$15000. each.

Consideration should be given to the possibility of purchasing machinery to turn brake drums and to rethread wires.

Parts Inventory

The operator estimates that new buses would require an inventory of standard parts for about \$10,000.

Heaters

For those vehicles held outside in colder weather, there is a need for engine plug-in heaters at a cost of \$300. apiece.

Coin Machines

The purchase of a coin-counting and wrapping machine would speed up office work and the cost would be approximately \$1,000.

Present Fare Structure

The present fare structure has not changed since the operation was initiated. The basic fare is 25¢. For passengers boarding the bus headed towards Main and School (center of the city), the rider pays when boarding. On buses travelling out-bound, that is, away from Main and School, the passenger pays 25¢ when leaving the bus. Therefore, an individual travelling through Main and School pays a total of 50¢. Students have the opportunity to buy tickets from the driver (10 tickets for \$4.50 or 45¢ a ride). Students without tickets are required to pay the regular fare.

The elderly fare is 15¢. This applies to individuals 60 years of age or older, and proof of age is an elderly identification card with the individual's picture on it, provided by the City of Brockton.

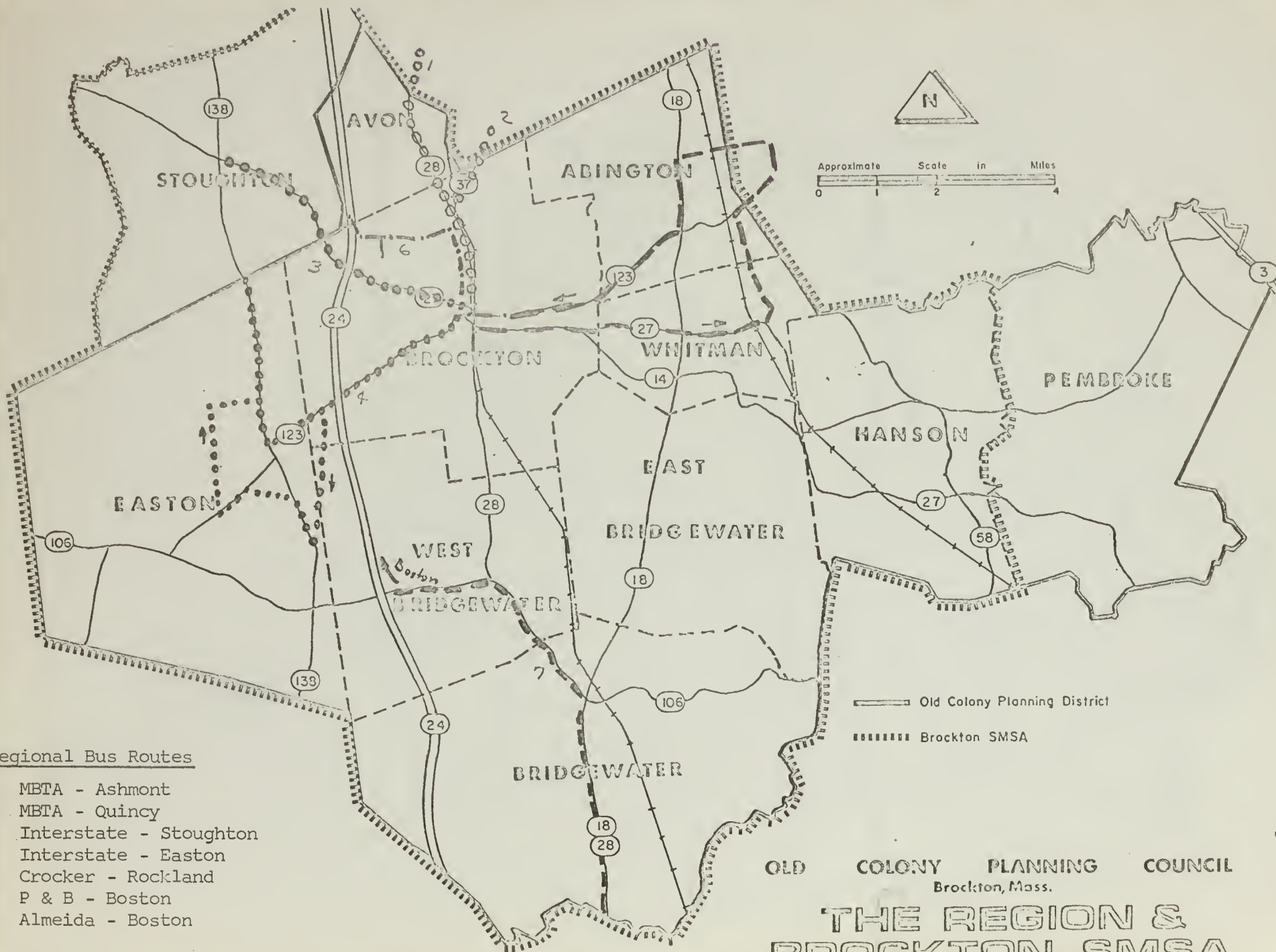
For those services, the fare is 50¢ if the trip is made within one town, and 54¢ if a passenger travels between towns.

Driver Costs

The drivers for the Cooper Transit System, Inc. are unionized. They presently receive 11.4¢ per hour, but a contract requiring a cost of living adjustment every three years. They are about to obtain a 12¢-per hour increase and the operator expects that by May, 1975, the drivers will be receiving about 16.35 per hour. At present, the fringe cost which is retirement, unemployment, and social security, vacation, and sick time, amounts to 85¢ per hour.

Present Figures

Figures 1 and 2 show the figures in effect as of January 1, 1975 by the company providing the service. The figures include both local bus service and service provided by interregional operators. Appendix 4 lists the operating companies of each of the companies.

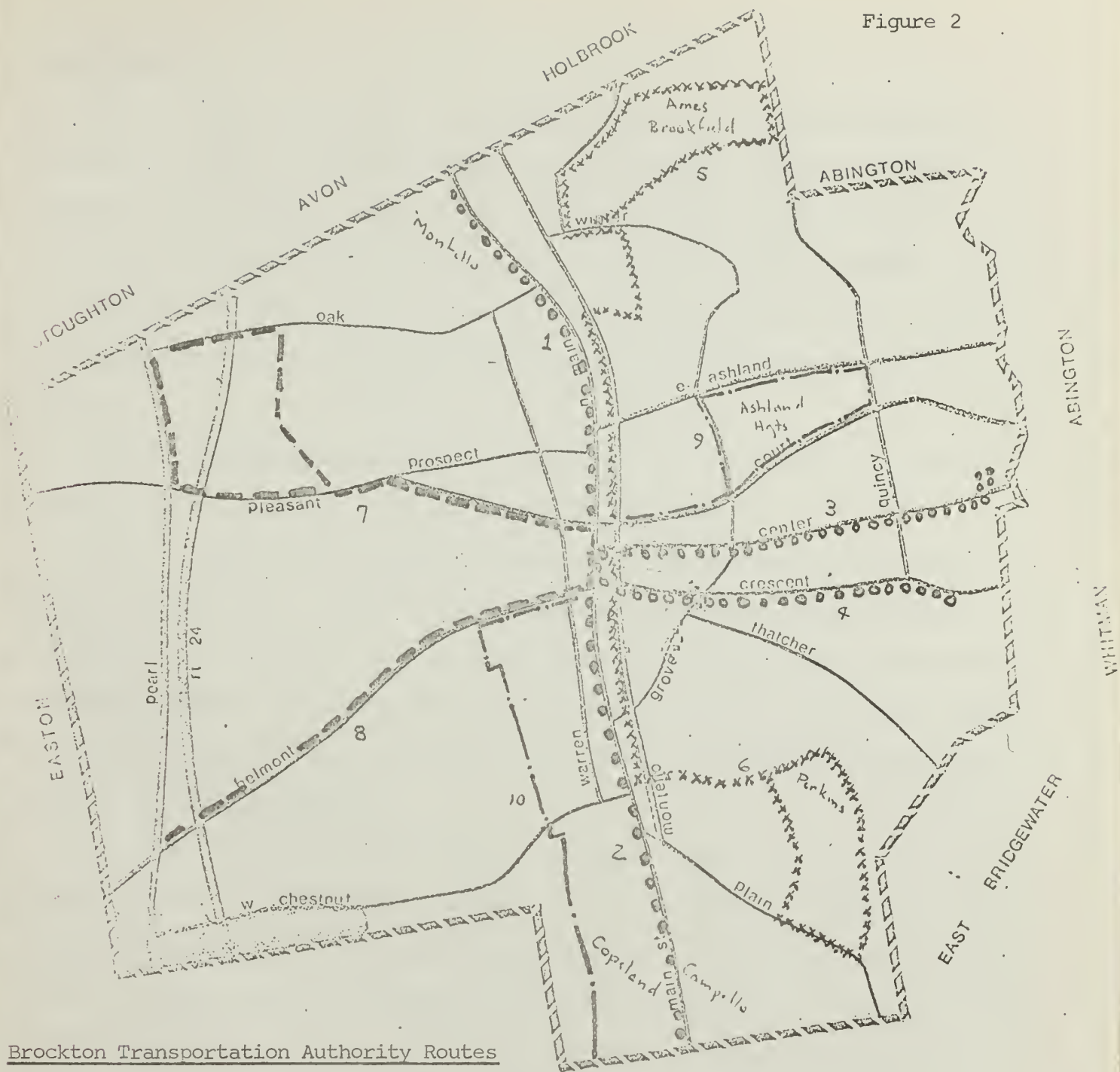


Regional Bus Routes

- 1 MBTA - Ashmont
- 2 MBTA - Quincy
- 3 Interstate - Stoughton
- 4 Interstate - Easton
- 5 Crocker - Rockland
- 6 P & B - Boston
- 7 Almeida - Boston

Figure 1

Figure 2



Brockton Transportation Authority Routes

- 1 Montello
- 2 Campello
- 3 Center
- 4 Crescent
- 5 Ames
- 6 Perkins
- 7 Pleasant
- 8 Belmont
- 9 Ashland Heights
- 10 Copeland

TOWN OF WEST BRIDGEWATER



0 1000 2000 3000 ft.

Dependability

As part of the analysis of the present operations, a study was conducted to determine the rate at which the various operators maintained their published schedules. The important point in this investigation is that if public is to utilize the service, the public must be able to depend upon that service. That is, when an individual expect a bus to pick him up at a specific time, and the bus arrives too early or too late, that individual will find another way to travel.

This investigation was conducted at the Main and School Streets intersection where all of the companies providing service in the region.

Table 5 shows the bus schedule adherence or dependability by the Crocker Transit Systems, Inc. The data were collected by company bus run. That is, the legend on the front of the bus. For example, at Main and School, the vehicles destined to Montello were summarized for that end of the route. The return trips for that bus, when it reached Main and School, would be destined to Campello and were summarized under Campello.

For the most part, the dependability of service on the day of the survey was rather reasonable. However, there are a number of incidents that should be considered. The Montello run had three cases in which the bus did not make the trip at all. That is, three time periods during which individuals were standing on the corner waiting for a bus that did not show up, and encouraging that group of individuals to find another means of travelling to Montello in the future. In a number of instances, buses left Main and School ahead of schedule, therefore possibly leaving potential riders standing on the corner that would have caught the bus, had it been on schedule. In only one case was the service more than six minutes late in leaving Main and School. Further analysis of the table indicates an average lay-over, that is the average amount of time that a bus waits at Main and School from the time it arrives until the time it leaves, of nine minutes for Ames and an average of 6.5 minutes for all buses. The important

point presented by these statistics is that a person who wishes to continue his trip through the center of Brockton must spend this amount of time sitting on the bus, waiting for the bus to continue its journey. However, when frequencies are lengthy, that is up to 25 minutes or more, it is relatively important that the buses provide an opportunity in the center of town for individuals to transfer without a lengthy wait. That is, if the lay-over time was only a minute or so, and a Montello bus left before a Pleasant Street bus arrived, the Pleasant Street passenger wishing to transfer to Montello would have to wait a lengthy period of time for the next bus. However, if the headways were reduced to ten to fifteen minutes, the buses could make the trip through Main and School with no layover. The transferring rider would not have a lengthy wait until the next bus arrived. On Friday, January 31, 1975, the bus schedule adherence was rechecked from 6:00 AM to 3:00 PM this time, and special effort was made to obtain a count of the number of passengers going through Main and School Streets. These passengers are, in fact, paying a double fare; when they get on, and when they get off. This special count was made to determine the effect of the elimination of the double fare. Table 5A shows the data for Crocker service.

Table 6 shows the schedule dependability for the Interstate Coach Company and the Plymouth and Brockton Street Railway Company. Table 6A shows the data collected on Friday, January 31, 1975 for Interstate Coach and P and B. The MBTA is shown in Table 7.

Table 5

Bus Schedule Dependability Check

November 19, 1974 11:30 AM to 5:30 PM

Route	Actual vs. Schedules Times					Average Layover Time(Min)	Average No. Passengers Leaving Stop
	Leaving Main and School						
	No Show	Early	On Time	Late			
				2-5 Min	6-10 Min		
Montello	3 ¹	1	5	3	-	4	6
Campello	-	1	8	3	-	5	9
Crescent	-	-	11	1	-	8	4
Center	-	1	6	3	-	7	4
Belmont	1	-	5	3	-	7	8
Pleasant	-	-	6	3	-	6	6
Ames	-	2	4	3	-	9	8
Perkins	-	1	5	2	-	8	4
Grafton	-	-	4	2	-	4	5
Ashland	-	1	-	2	1	5	3
	4	7	65	25	1		

1 Accident affected "No Shows"

Table 5A

Bus Schedule Dependability Check

January 31, 1975 6:00 AM to 3:00 PM

Route	Actual vs. Schedules Times					Average Layover Time(Min)	Number of Through Passengers
	Leaving Main and School						
	No Show	Early	On Time	Late			
2-5 Min				6-10 Min			
Montello	1	1	14	2	-	4	-
Campello	-	9	6	3	1	3	12
Crescent	-	11	7	-	-	7	1
Center	-	11	7	-	1	10	1
Belmont	-	5	8	1	-	7	14
Pleasant	-	6	6	1	-	8	1
Ames	-	5	8	1	-	9	-
Perkins	1	5	5	-	-	7	-
Grafton	-	7	-	-	-	9	-
Ashland	-	-	2	-	-	6	6
Rockland	<u>-</u>	<u>9</u>	<u>-</u>	<u>-</u>	<u>-</u>	11	<u>2</u>
	2	69	63	8	2		37

Table 6

Schedule Dependability

November 19, 1974 1:50 PM to 5:30 PM

Route	Actual vs. Scheduled Times					Average Layover Time(Min)	Average No. Passengers Leaving Stop
	Leaving Main and School						
	No Show	Early	On Time	Late			
				2-5Min	6-10 Min		
Easton		2 ¹	1			13	6
Belmont	3				1 ²	16	2
Stoughton			3			11	11
<u>P and B</u>							
Boston via Westgate			4			25 ³	

1 One bus 4 minutes early; one bus 15 minutes early

2 Buses should have left at 3:00 PM and 3:30 PM. This bus left at 3:15 PM after 15-minute layover.

3 38 minutes highest

Table 6A

Schedule Dependability

January 31, 1975 6:00 AM to 3:00 PM

Actual vs. Scheduled Times					
Leaving Main and School					
Route	No Show	Early	On Time	Late	
				2-5Min	6-10 Min
Easton			2		
Belmont	1	1	3		
Stoughton		6 ¹	1		
<u>P and B</u>					
Boston via Westgate		3	5	1	

1 One bus left 7 minutes early.

Table 7

Bus Schedule Check

MBTA Brockton-Ashmont Route

Data for 11/12/74

Actual arrival time compared to scheduled arrival time --

at Avon Square (Inbound)

	<u>6 a.m. to Noon</u>	<u>Noon to 8 p.m.</u>
Early	1	
On time	2	
1 to 5 minutes late	4	4
6 to 10 minutes late	1	8
11 to 15 minutes late		3
Bus not on the schedule	$\frac{3}{11}$	$\frac{15}{15}$

at Main and School - Brockton

	<u>6 a.m. to Noon</u>	<u>Noon to 8 p.m.</u>
Early	5	5
On time		2
1 to 5 minutes late		2
6 to 10 minutes late		3
11 to 15 minutes late		2
Missed	$\frac{2}{7}$	$\frac{1}{15}$

MBTA Brockton/Ashmont (Outbound)

	<u>No Show</u>	<u>Early</u>	<u>On Time</u>	<u>Late</u>	
		<u>11></u>	<u>1-10</u>	<u>2-5</u>	<u>6-10</u> <u>11></u>
Arrive at Avon Square					
5:00 AM to Noon		2	6	1	1
Noon to 8:00 PM			7	1	
Leave Main & School			3	19	1 1

Previous Promotional Programs

Since the present operation was initiated (September, 1973) there has not been a significant amount of promotion.

On one occasion the Chamber of Commerce sponsored a newspaper coupon promotion in conjunction with a downtown sidewalk sale. The rider had the opportunity to remove the coupon from the newspaper for a free ride on the bus. The Transportation Authority paid for the newspaper advertisement and the Chamber of Commerce reimbursed the operator for the coupons. In addition, the Transportation Authority has printed schedules twice. The first time the printing was for 2000 copies of the schedule at a cost of \$300. and the most recent printing, September, 1974, was for 4000 copies at a cost of \$500. In addition, the Transportation Authority has developed a mini-bus service announcement printed by the Authority to describe changes in present service and improvements in service which are mailed to those organizations and agencies which could get the most use from the service.

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Square Miles	Pop.	Min. Pop.	Over 65	# Autos	Income Median	# Fam. <\$6,000
Abington	111	2.11	420					
	112	.43	693					
	113	1.20	983					
	114	.68	107					
.91	59000*	4.42	2,203	10	132	848	11,441	117
	115	.95	1,183					
	116	.72	1,840					
	117	.12	684					
1.06	59200*	1.79	3,707	0	366	1,519	10,829	257
	118	.24	0					
	59303*	0.24	0	0	0	0	0	0
	119	.59	1,255					
1.04	120	.48	708					
	59102*	1.07	1,963	0	79	827	11,744	83
	121	.57	1,148					
	122	.21	623					
	123	.73	1,614					
	124	.49	578					
	125	.36	498					
	59101 *	2.36	4,461	0	438	1,679	11,354	263
.98								
total	(9.7)	9.88	12,334	10	1,015	4,873		720
Avon.	001	.19	0					
	002	.67	423					
	003	.75	409					
	004	.26	963					

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Square Miles	Pop.	Min. Pop.	Over 65	# Autos	Income Median	Fam. \$6,000
Avon (continued)	005	.00	472					
	006	.62	1,192					
	.98 57501*	2.57	3,459	24	24	1,314	10,574	209
	007	.25	179					
	008	.46	32					
	009	.28	161					
	010	.27	546					
	011	.05	79					
	012	.05	118					
	013	.18	596					
	014	.26	125					
	1.06 57502*	1.80	1,836	40	117	771	13,175	72
	total (4.35)	4.37	5,295	64	361	2,085		281
	Bridgewater 156	2.64						
	157	2.33						
	158	.95						
	159	2.40						
	60403*	8.32	1,879	49	104	752	11,441	78
	160	.68						
	60402*	0.68	1,927	13	275	691	10,434	218
	161	.48						
	60401*	0.48	1,085	0	128	475	10,074	116
	162	1.74						
	163	.99						
	164	3.55						

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS TOWNS

Town	BAZ/ J to W*	Square Miles	Pop.	Min. Pop.	Over 65	# Autos	Income Median	Fam. < \$6,000
Bridgewater (continued)	60404*	6.28	1,949	109	148	793	12,085	10
	165	.88						
	166	3.10						
	167	2.24						
	168	1.79						
	60504*	8.01	2,446	30	133	1,014	10,149	118
	169	.95						
	60503*	.95	1,020	0	105	394	8,363	93
	170	2.71						
	60502*	2.71	1,523	59	99	72	10,452	107
	total	27.43	11,829	260	992	4,191		740
Brockton	028	.43	1,043					
	029	.23	642					
	030	.11	465					
	58103*	0.83	2,165	0	262	981	12,087	125
	031	.32	6					
	032	.35	84					
	033	.16	714					
	034	.44	980					
	035	.44	915					
	036	.37	993					
	037	.18	1,381					
	038	.11	1,453					
	58501*	2.37	6,526	128	645	2,569	10,518	625
	1.24							

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Square Miles	Pop.	Min. Pop.	Over 65	# Autos	Income Median	Fam. <\$6,000
Brockton (continued)	039	.60	751					
	040	.38	589					
.62	58402*	0.98	1,340	11	117	505	11,652	79
	041	.70	621					
	042	.24	409					
	043	.09	385					
	58302*	1.03	1,415	0	257	645	13,937	94
0.61	044	.21	851					
	045	.19	1,360					
	046	.18	1,527					
	58303*	0.58	3,738	30	533	1,545	12,548	327
	047	.11	21					
.93	048	.12	1,341					
	58203*	0.23	1,362	0	165	528	10,674	103
	049	.44	1,036					
	050	.16	102					
	051	.17	27					
1.35	58401*	0.77	1,165	0	0	332	15,354	0
	052	.30	759					
	58301*	0.30	759	0	0	0	0	0
	053	.51	1,106					
	054	.16	0					
5.11	055	.33	778					
	056	.18	436					
	057	.23	1,707					
63.25								

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR URBAN ANALYSIS GROUP

Town	BAZ/ J to W*	Square Miles	Pop.	Min. Pop.	Over 65	% Auto	Income Median	Fam. \$56,000
Brockton (continued)	058	.28	497					
	059	.15	1,237					
19.53	58202*	1.84	5,761	0	98	1,065	11,634	78
	060	.12	1,591					
1.07	58504*	0.12	1,483	9	227	581	9,445	195
	061	.20	3,013					
	062	.13	1,702					
.97	58304*	0.33	4,715	74	893	1,569	7,706	749
	063	.13	1,405					
	064	.15	1,117					
	065	.10	1,179					
1.01	58507*	0.23	2,701	42	016	1,198	7,609	586
	066	.19	3,210					
	067	.00	983					
.96	58605*	.17	4,497	141	128	1,237	7,905	554
	068	.10	1,115					
1.07	58601*	0.17	1,115	77	160	346	2,097	273
	069	.03	846					
1.02	58603*	0.08	1,115	16	188	118	9,188	287
	070	.11	1,160					
.85	58607*	0.11	1,160	151	213	356	5,571	328
	071	.23	2,908					
.41	58205*	.23	2,908	69	397	961	10,566	244
	072	.07	1,914					
.27	58605*	.07	1,914	3	112	457	10,966	96

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR JOURNEY-TO-WORK ZONES

Town	BAZ J to W*	Square Miles	Pop.	Min. Pop.	Over 65	# Autos	Income Median	Fam. ≤\$6,000
Brockton (continued)	073	.17	2,438					
	074	.10	1,624					
	1.09 58204*	0.27	4,062	9	544	1,428	8,287	508
	075	.21	3,576					
	076	.15	960					
	077	.29	476					
	078	.37	1,587					
	079	.22	38					
	080	.35	0					
	2.82 58201*	1.59	6,637	14	953	2,772	9,966	671
1.06	081	.52	1,556					
	082	.26	2,015					
	083	.38	2,445					
	58903*	1.18	6,016	33	214	2,154	11,355	191
	084	.08	152					
	085	.40	1,971					
	086	.19	434					
	087	.49	2,329					
	088	.73	877					
	.95 58902*	1.89	5,763	64	483	1,987	10,019	394
1.08	089	.14	497					
	090	.22	1,278					
	58602*	0.36	1,775	22	159	594	8,270	205
	091	.06	636					
	092	.13	610					
	1.05 58603*	0.19	1,246	384	110	232	5,589	184
	093	.36	2,728					
	094	.22	694					

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Square Miles	Pop.	Min. Pop.	Over 65	# Autos	Income Median	Fam. < \$6,000
Brockton (continued) .53	58901*	0.58	3,422	42	225	1,161	10,263	176
	095	.40	1,279					
.51	096	.35	2,161					
	58802*	0.75	3,440	181	234	1,035	10,049	207
	097	.14	1,571					
	098	.16	623					
	099	.25	666					
	58801*	0.55	2,860	259	737	1,951	9,485	531
2.29	100	.15	1,098					
	101	.76	575					
	58702*	.91	1,673	98	150	588	10,374	137
0.99	102	.11	1,484					
	58604*	0.11	1,484	0	222	433	6,004	264
1.52	103	.22	1,256					
	104	.33	1,952					
	105	.35	431					
	106	.05	214					
	107	.35	514					
	108	.49	179					
	109	.26	363					
	110	.26	545					
	58701*	2.31	5,454	30	744	2,047	9,592	592
	(21.37)	21.29	89,035	1,962	9,921	32,266		8,803
1.38 total								
E. Bridge- water	146	2.13	614					

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Adj. Sq. Mi.	Pop.	Min. Pop.	Over 65	# Autos	Income Median	Fam. < \$6,000
E. Bridge- water (continued)	147	.29	150					
	148	.85	1,305					
	149	.41	178					
	150	1.57	596					
	151	1.79	1,107					
	.95 60302*	7.05	3,950	46	375	1,538	10,270	217
	152	2.47						
	153	2.67						
	1.1 60303*	5.14	2,104	0	186	817	10,275	122
	154	2.08	1,855					
	155	1.39	438					
	1.0 60301*	3.47	2,293	0	182	1,029	11,181	156
total	(15.49)	15.66	8,349	46	743	3,384		495
Easton	015	1.39						
	016	1.18						
	017	2.74	2,091					
	018	1.03	2,693					
	019	1.27	1,029					
	57800*	7.61	6,594	22	603	2,385	11,146	348
	020	2.08						
	021	3.71						
	022	1.75						
	023	3.36						
	024	2.67						

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Square Miles	Pop.	Min. Pop.	Over 65	# Autos	Income Median	Fam. \$6,000
Easton (continued)	025	3.37						
	026	2.94	2,608					
	027	1.32	481					
	57900*	21.20	5,563	20	316	2,417	12,508	270
	total (29.04)	28.81	12,157	42	919	4,802		618
Hanson	171	1.94						
	172	.81						
	173	.31						
	60700*	3.06	1,623	0	89	579	10,974	61
	174	1.94						
	175	1.06						
	176	.69						
	177	2.55						
	178	1.65						
	60702*	7.89	2,351	19	216	1,022	10,916	148
	179	.64						
	180	1.25						
	60701*	1.89	1,795	0	114	709	11,181	71
	181	.98						
	182	1.01						
	183	.46						
	60703*	2.45	1,379	183	93	468	9,872	67
	total (15.17)	15.29	7,148	201	512	2,778		347
Pembroke	190	1.92						
	191	1.88						

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Square Miles	Pop.	Min. Pop.	Over 65	# Autos	Income Median	Fam. < \$6,000
Pembroke (continued)	60903/ 60904*	3.80						
	192	2.19						
	193	2.16						
	60901/ 60902*	4.35						
	194	1.46						
	60903/ 60904*	1.46						
	195	0.93						
	60905*	0.93						
	196	1.55						
	60906/ 60907*	1.55						
	197	1.11						
	60908*	1.11						
	198	3.61						
	199	2.31						
	200	2.49						
	60801/ 60802*	8.41						
total	(21.53)	21.61	11,193*	115*		5,016*		
W. Bridge- water 1.08	137	1.54	307					
	58000*	1.54	307	0	31	98	10,510	24
	138	2.21						
	139	1.77						

* From OCPC 1974 Report

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Square Miles	Pop.	Min. Pop.	Over 65	# Autos	Income Median	Fam. < \$6,000
W. Bridge- water (continued)	58001*	3.98	470	0	31	197	12,254	41
	140	3.82	1,319					
	141	.73	323					
	142	1.70	2,417					
	143	1.44	374					
	144	1.16	1,195					
	145	1.22	747					
	58100*	10.07	6,375	20	516	2,158	11,103	278
	1.14 total	(15.49)	7,152	23	578	2,453		343
Whitman	126	.89	1,407					
	127	.33	1,696					
	128	1.02	1,569					
	129	.42	1,688					
	130	.75	470					
	131	.24	145					
	60201*	3.65	6,975	39	534	2,673	10,812	371
	132	.59	1,057					
	133	.38	1,766					
	134	.57	2,463					
	135	.48	331					
	136	1.05	467					
	60202*	3.07	6,084	22	695	2,288	10,060	535
	total	(6.70)	13,059	61	1,229	4,961		906
Halifax	184	4.45						

Date _____

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Square Miles	Pop.	Min. Pop.	Over 65	# Autos	Income Median	Fam. < \$6,000
Halifax (continued)	185	.91						
	186	2.18						
	60601	7.54						
	187	5.47						
	188	2.50						
	189	1.87						
	60603	9.84						
total	(17.37)	17.38	3,468*	21*		1,540*		
Stoughton	201	1.24	1,896					
	202	1.49	4,405					
	203	3.88	1,405					
	.99 57700*	6.61	7,706	126	441	2,682	11,416	394
	204	0.70	573					
	205	1.14	3,930					
	57601*	1.84	4,503	92	369	1,569	10,288	311
	206	.60	3,512					
	207	2.20	2,768					
	208	1.45	1,892					
	57603*	4.25	8,172	149	719	3,002	11,460	424
	209	1.94	2,554					
	210	1.42	524					
	57602*	3.36	3,078	19	147	1,121	12,655	64
TOT	(16.25)	16.06	23,459	386	1,676	8,374		1,193

* From OCPC 1974 Report

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Pop/ Mi. ²	Autos/ 1000 pop	Over 65/ Mi. ²	% Min Pop		
Abington	111	199					
	112	2310					
	113	819					
	114	178					
	59000*	498	385	30	.5%		
	115	1245					
	116	2555					
	117	5700					
	59200*	2071	410	204	0		
	118	0					
	59303*	0	0	0	0		
	119	2127					
	120	1475					
	59102*	1835	421	74	0		
	121	2014					
	122	2967					
	123	2211					
	124	1180					
	125	1383					
	59101*	1890	376	186	.0		
	total	1248	395	103	.1%		
Avon	001	0					
	002	631					
	003	545					
	004	3704					

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Pop/ 2 Mi.	Autos/ 1000 Pop	Over 65/ Mi ²	% Min Pop		
Avon (continued)	005	5900					
	006	1923					
	57501*	1346	380	95	.7%		
	007	716					
	008	70					
	009	575					
	010	2022					
	011	1580					
	012	2360					
	013	3311					
	014	481					
	57502*	1020	420	65	2.2%		
	total	1212	394	83	1.2%		
Bridgewater	156						
	157						
	158						
	159						
	60403*	226	400	13	2.6%		
	160						
	60402*	2834	359	404	.7%		
	161						
	60401*	2260	438	267	0		
	162						
	163						
	164						

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*		Pop/ Mi ²	Autos/ 1000 Pop	Over 65/ Mi ²	% Min Pop		
Bridgewater (continued)	60404*		310	407	24	5.6%		
	165							
	166							
	167							
	168							
	60504*		305	415	17	1.2%		
	169							
	60503*		1074	386	111	0		
	170							
	60502*		562	47	37	3.8%		
	total		431	354	36	2.2%		
Brockton	028		2,139					
	029		2835					
	030		4227					
	58403*		2608	453	316	0		
	031		19					
	032		240					
	033		4463					
	034		2227					
	035		2079					
	036		2684					
	037		7672					
	038		13209					
	58501*		2754	394	272	2.0%		

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Pop/ Mi ²	Autos/ 1000 Pop	Over 65/ Mi ²	% Min Pop		
Brockton (continued)	039	1252					
	040	1550					
	58402*	1367	377	119	.8%		
	041	887					
	042	1704					
	043	4277					
	58302*	1374	456	250	0		
	044	4052					
	045	7158					
	046	8483					
	58303*	6445	413	919	.8%		
	047	191					
	048	11175					
	58203*	5922	388	717	0		
	049	2355					
	050	638					
	051	159					
	58401*	1513	285	0	0		
	052	2530					
	58301*	2530	0	0	0		
	053	2169					
	054	0					
	055	2358					
	056	2422					
	057	7422					

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Pop/ Mi ²	Autos/ 1000 Pop	Over 65/ Mi ²	% Min Pop		
Brockton (continued)	058	1775					
	059	8247					
	58202*	3131	315	53	0		
	060	12425					
	58504*	12425	390	1892	.6%		
	061	15065					
	062	13092					
	58304*	14288	333	2433	1.6%		
	063	10308					
	064	7447					
	065	11790					
	58502*	9739	324	1621	2.5%		
	066	16916					
	067	12288					
	58503*	15544	295	1585	3.4%		
	068	11750					
	58601*	11750	329	1640	6.6%		
	069	7657					
	58607*	7657	407	2271	8.6%		
	070	10545					
	58606*	10545	307	1936	13.0%		
	071	13559					
	58205*	13559	322	1577	2.1%		
	072	14486					
	58605*	14486	451	1600	.3%		

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR JOURNEY-TO-WORK ZONES

Town	BAZ J to W*	Pop	Autos/ 1000 Pop	Over 65/ Mi ²	% Min Pop		
Brockton (continued)	073	16341					
	074	16240					
	58204*	15044	413	3.15	.2%		
	075	18310					
	076	6400					
	077	1641					
	078	4289					
	079	173					
	080	0					
	58201*	4174	418	599	.2%		
	081	2992					
	082	7196					
	083	6434					
	58903*	5098	358	181	.5%		
	084	1900					
	085	4928					
	086	2284					
	087	4753					
	088	1201					
	58902*	3048	345	256	1.1%		
	089	3550					
	090	5400					
	58602*	4931	335	442	1.2%		
	091	10000					
	092	4000					
	58603*	6458	186	579	30.8%		
	093	7578					
	094	3155					

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Pop/ Mi ²	Autos/ 1000 Pop	Over 65/ Mi ²	% Min Pop		
Brockton (continued)	58901*	5900	339	388	1.2%		
	095	3198					
	096	6174					
	58802*	4586	301	312	5.2%		
	097	11221					
	098	3894					
	099	2664					
	58801*	5200	682	340	4.1		
	100	7320					
	101	757					
	59702*	1838	351	165	5.9%		
	102	13491					
	58604*	13491	292	2018	0		
	103	5709					
	104	5915					
	105	1231					
	106	4280					
	107	1469					
	108	365					
	109	1396					
	110	2096					
	58701*	2361	375	322	.6%		
total		4190	362	467	2.2%		
E. Bridge- water	146	288					

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Pop/ Mi ²	Autos/ 1000 Pop	Over 65/ Mi ²	% Min. Pop		
E. Bridge- water (continued)	147	517					
	148	1517					
	149	434					
	150	380					
	151	618					
	60302*	560	389	53	1.2%		
	152						
	153						
	60303*	409	388	36	0		
	154	892					
	155	315					
	60301*	661	449	52	0		
	total	533	405	47	.6%		
Easton	015						
	016						
	017	763					
	018	2615					
	019	810					
	57800*	866	362	79	.3%		
	020						
	021						
	022						
	023						
	024						

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*		Pop/ Mi ²	Autos/ 1000 Pop	Over 65/ Mi ²	% Min Pop		
Easton (continued)	025							
	026		887					
	027		364					
	57900*		262	434	15	.4%		
	total		422	395	32	.3%		
Hanson	171							
	172							
	173							
	60700*		530	357	29	0		
	174							
	175							
	176							
	177							
	178							
	60702*		298	435	27	.8%		
	179							
	180							
	60701*		950	395	60	0		
	181							
	182							
	183							
	60703*		563	339	38	13.2%		
	total		467	389	33	2.8%		
Pembroke	190							
	191							

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*		Pop/ Mi ²	Autos/ 1000 Pop	Over 65/ Mi ²	% Min Pop		
Pembroke (continued)	60903/ 60904*							
	192							
	193							
	60901/ 60902*							
	194							
	60903/ 60904*							
	195							
	60905*							
	196							
	60906/ 60907*							
	197							
	60908*							
	198							
	199							
	200							
	60801/ 60802*							
total								
W. Bridge- water	137		199					
	58000*		199	319	20	0		
	138							
	139							

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Pop/ Mi ²	Autos/ 1000 Pop	Over 65/ Mi ²	% Min Pop		
W. Bridge- water (continued)	58001*	118	419	8	0		
	140	345					
	141	442					
	142	1422					
	143	260					
	144	1030					
	145	612					
	58100*	633	339	51	.3%		
	total	459	343	37	.3%		
Whitman	126	1581					
	127	5139					
	128	1538					
	129	4019					
	130	627					
	131	604					
	60201*	1911	383	146	.6%		
	132	1792					
	133	4647					
	134	4321					
	135	686					
	136	445					
	60202*	1982	376	226	.4%		
	total	1943	380	183	.5%		
Halifax	184						

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR BASIC ANALYSIS ZONES

Town	BAZ/ J to W*	Pop/ Mi ²	Autos/ 1000 Pop	Over 65/ Mi ²	% Min Pop		
Halifax (continued)	185						
	186						
	187						
	188						
	189						
total		200					
Stoughton	201	1529					
	202	2956					
	203	362					
	57700*	1166	348	67	1.6%		
	204	819					
	205	3447					
	57601*	2447	348	201	2.0%		
	206	5853					
	207	1258					
	208	1305					
	57603*	1923	367	169	1.7%		
	209	1316					
	210	369					
	57602*	916	364	44	1.6%		
TOTAL		1461	357	104	1.6%		

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR JOURNEY-TO-WORK ZONES

Town	Journey-to-Work Zone	Employees*	Employees per mi ²				
Abington	59000	120	27				
	59101	375	159				
	59102	99	93				
	59200	395	221				
total		989	100.1				
Avon	57501						
	57502						
total							
Bridgewater	60401						
	60402						
	60403						
	60404						
	60502						
	60503						
	60504						
total							
Brockton	58201	183	115				
	58202*	35	19				
	58203	113	491				
	58204	850	3148				
	58205	1357	6168				
	58301	0	0				
	58302	694	674				
	58303	580	1000				
	58304	816	2473				

SOURCE: 1970 Census Journey to Work Trip Table

* 1975 update reflects 412 employees or 2,575 employees per square mile

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR JOURNEY-TO-WORK ZONES

Town	Journey-to-Work Zone	Employees*	Employees per mi ²				
Brockton (continued)	58401*	7	9				
	58402	970	990				
	58403	389	469				
	58501**	483	204				
	58502	923	2429				
	58503	878	3252				
	58504	152	1267				
	58601	0	0				
	58602	296	822				
	58603	491	2033				
	58604	444	4036				
	58605	772	11029				
	58606	89	870				
	58607	49	700				
	58701	2267	981				
	58702	281	312				
	58801	483	878				
	58802	838	1117				
	58901	852	1469				
	58902	967	572				
	58903	165	140				
	total	16327	768				
East Bridge- water	60301						
	60302						
	60303						

* 1975 update reflects 602 employees or 4,718 employees per square mile in BAZ 051 which includes part of Brockton Industrial Park.

** 1975 update reflects 1672 employees or 4777 employees per square mile in BAZ 032 which includes Westgate Mall. BAZ 034 has 700 employees

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR JOURNEY-TO-WORK ZONES

Town	Journey-to-Work Zone	Employees*	Employees per mi ²				
Easton	57800						
	57900						
	total						
Hanson	60700						
	60701						
	60702						
	60703						
	total						
Pembroke	60801						
	60802						
	60901						
	60902						
	60903						
	60904						
	60905						
	60906						
	60907						
	60908						
	total						
W. Bridge-water	58000						
	58001						
	58100						
	total						
Whitman	60201		513	141			
	60202		812	264			

BROCKTON AREA TRANSIT STUDY - STATISTICS FOR JOURNEY-TO-WORK ZONES

Town	Journey- to-Work Zone	Employees*	Employees per mi ²				
Halifax	60601						
	60602						
	60603						
	total						
Stoughton	57601	963	523				
	57602	171	51				
	57603	935	220				
	57700	477	72				
	total	2546	159				

APPENDIX 4

Bus Schedules

MONTELO VIA NORTH MAIN STREET

WEEKDAY		SATURDAY	
OUTBOUND	INBOUND	OUTBOUND	INBOUND
<i>Lv. Downtown Main St.</i>	<i>Lv. Avon Line N. Main St.</i>	<i>Lv. Downtown Main St.</i>	<i>Lv. Avon Line N. Main St.</i>
6:00 a.m.	6:15 a.m.	8:00 a.m.	8:15 a.m.
6:30	6:45	8:30	8:45
7:00	7:15	9:00	K 9:15
7:30	7:45	9:30	9:45
8:00	8:15	10:00	K 10:15
8:30	8:45	K 10:30	10:45
9:00	K 9:15	11:00	11:15
9:30	9:45	K 11:30	11:45
10:00	K 10:15		
K 10:30	10:45		
11:00	11:15		
K 11:30	11:45		
12:00 noon	K 12:15 p.m.	12:00 noon	K 12:15 p.m.
12:30 p.m.	12:45	12:30 p.m.	12:45
1:00	K 1:15	1:00	K 1:15
K 1:30	1:45	K 1:30	1:45
2:00	K 2:15	2:00	K 2:15
K 2:30	2:45	K 2:30	2:45
3:00	K 3:15	3:00	K 3:15
K 3:30	3:45	K 3:30	3:45
4:00	4:15	4:00	4:15
K 4:30	4:45	K 4:30	4:45
5:00	5:00	5:00	5:15
5:30	5:45	5:30	5:45

NOTE: No Service on Sundays or Holidays.
K - trips via Kennedy Drive.

CAMPELLO VIA MAIN STREET

WEEKDAY		SATURDAY	
OUTBOUND	INBOUND	OUTBOUND	INBOUND
<i>Lv. Downtown School St.</i>	<i>Lv. Big G, K Mart, and BPM South Plaza</i>	<i>Lv. Downtown School St.</i>	<i>Lv. Big G, K Mart, and BPM South Plaza</i>
6:00 a.m.	6:15 a.m.	8:00 a.m.	8:15 a.m.
6:30	6:45	8:30	8:45
7:00	7:15	9:00	9:15
7:30	7:45	9:30	9:45
8:00	8:15	10:00	10:15
8:30	8:45	10:30	10:45
9:00	9:15	11:00	11:15
9:30	9:45	11:30	11:45
10:00	10:15		
10:30	10:45		
11:00	11:15		
11:30	11:45		
12:00 noon	12:15 p.m.	12:00 noon	12:15 p.m.
12:30 p.m.	12:45	12:30 p.m.	12:45
1:00	1:15	1:00	1:15
1:30	1:45	1:30	1:45
2:00	2:15	2:00	2:15
2:30	2:45	2:30	2:45
3:00	3:15	3:00	3:15
3:30	3:45	3:30	3:45
4:00	4:15	4:00	4:15
4:30	4:45	4:30	4:45
5:00	5:15	5:00	5:15
5:30	5:45	5:30	5:45

NOTE: No Service on Sundays or Holidays.

CRESCENT STREET

WEEKDAY		SATURDAY	
OUTBOUND	INBOUND	OUTBOUND	INBOUND
<i>Lv. Downtown School St.</i>	<i>Lv. Alger St.</i>	<i>Lv. Downtown School St.</i>	<i>Lv. Alger St.</i>
6:00 a.m.	6:15 a.m.	8:30 a.m.	8:45 a.m.
6:30	6:45	9:30	9:45
7:00	7:15	10:30	10:45
7:30	7:45	11:30	11:45
8:00	8:15		
8:30	8:45		
9:00	9:15		
9:30	9:45		
10:00	10:15		
10:30	10:45		
11:00	11:15		
11:30	11:45		
12:00 noon	12:15 p.m.	12:30 p.m.	12:45 p.m.
12:30 p.m.	12:45	1:30	1:45
1:00	1:15	2:30	2:45
1:30	1:45	3:30	3:45
2:00	2:15	4:30	4:45
2:30	2:45	5:30	5:45
3:00	3:15		
3:30	3:45		
4:00	4:15		
4:30	4:30		
5:00	5:00		
5:30	5:45		

NOTE: No Service on Sundays or Holidays.

CENTER ST. — BROCKTON HOSPITAL

WEEKDAY		SATURDAY	
OUTBOUND	INBOUND	OUTBOUND	INBOUND
<i>Lv. Downtown School St.</i>	<i>Lv. Edward St.</i>	<i>Lv. Downtown School St.</i>	<i>Lv. Edward St.</i>
6:00 a.m.	6:15 a.m.	8:00 a.m.	8:15 a.m.
6:30	6:45	9:00	9:15
7:00	7:15	10:00	10:15
7:30	7:45	11:00	11:15
8:00	8:15		
8:30	8:45		
9:00	9:15		
9:30	9:45		
10:00	10:15		
10:30	10:45		
11:00	11:15		
11:30	11:45		
12:00 noon	12:15 p.m.	12:00 noon	12:15 p.m.
12:30 p.m.	12:45	1:00	1:15
1:00	1:15	2:00	2:15
1:30	1:45	3:00	3:15
2:00	2:15	4:00	4:15
2:30	2:45	5:00	5:15
3:00	3:15		
3:30	3:45		
4:00	4:15		
4:30	4:45		
5:00	5:15		
5:30	5:45		

NOTE: No Service on Sundays or Holidays.

BELMONT AND TORREY STREETS
(All trips via V.A. Hospital)

WEEKDAY		SATURDAY	
OUTBOUND	INBOUND	OUTBOUND	INBOUND
Lv. Downtown School St. Main St.	Lv. Marshall's Corner Belmont- Pearl Sts.	Lv. Downtown School St.	Lv. Marshall's Corner Belmont- Pearl Sts.
6:30 a.m.	6:45 a.m.	8:10 a.m.	8:30 a.m.
7:00	7:15	8:50	9:10
7:30	7:50	9:30	9:50
8:10	8:30	10:10	10:30
8:50	9:10	10:50	11:10
9:30	9:50	11:30	11:50
10:10	10:30		
10:50	11:10		
11:30	11:50		
12:10 p.m.	12:30 p.m.	12:10 p.m.	12:30 p.m.
12:50	1:10	12:50	1:10
1:30	1:50	1:30	1:50
2:10	2:30	2:10	2:30
2:50	3:10	2:50	3:10
3:30	3:50	3:30	3:50
4:10	4:30	4:10	4:30
4:50	5:10	4:50	5:10
5:30	5:45	5:30	5:45

NOTE: No Service on Sundays or Holidays.

PLEASANT STREET
(All trips via Westgate Mall)

WEEKDAY		SATURDAY	
OUTBOUND	INBOUND	OUTBOUND	INBOUND
Lv. Downtown Main St.	Lv. N. Pearl and Pleasant Sts.	Lv. Downtown Main St.	Lv. N. Pearl and Pleasant Sts.
6:30 a.m.	6:45 a.m.	8:10 a.m.	8:30 a.m.
7:00	7:15	8:50	9:10
7:30	7:50	M 9:30	M 9:50
8:10	8:30	10:10	10:30
8:50	9:10	M 10:50	11:10
M 9:30	M 9:50	11:30	M 11:50
10:10	10:30		
M 10:50	11:10		
11:30	M 11:50		
12:10 p.m.	12:30 p.m.	12:10 p.m.	12:30 p.m.
12:50	1:10	12:50	1:10
M 1:30	M 1:50	M 1:30	M 1:50
2:10	2:30	2:10	2:30
2:50	3:10	2:50	3:10
M 3:30	M 3:50	M 3:30	M 3:50
4:10	4:30	4:10	4:30
M 4:50	5:10	M 4:50	5:10
5:30	5:45	5:30	5:45

NOTE: No Service on Sundays or Holidays.
M - trips via Malvern Road

AMES STREET - BROOKFIELD
Via N. Montello St.

WEEKDAY	
OUTBOUND	INBOUND
Lv. Downtown Main St.	Lv. N. Quincy and Hovendon Sts.
6:30 a.m.	6:45 a.m.
7:00	7:15
7:30	7:50
8:10	8:30
8:50	9:10
9:30	9:50
10:10	10:30
10:50	11:10
11:30	11:50
12:10 p.m.	12:30 p.m.
12:50	1:10
1:30	1:50
2:10	2:30
2:50	3:10
3:30	3:50
4:10	4:30
4:50	5:10
5:30	5:45

NOTE: No Service on Saturdays, Sundays or Holidays.

PERKINS, PLAIN, AND EAST STS.
Via Montello St.

WEEKDAY	
OUTBOUND	INBOUND
Lv. Downtown School St.	Lv. N. Quincy and Hovendon Sts.
6:30 a.m.	6:45 a.m.
7:00	7:15
7:30	7:50
8:10	8:30
8:50	9:10
9:30	9:50
10:10	10:30
10:50	11:10
11:30	11:50
12:50 p.m.	1:10 p.m.
2:50	2:30
3:30	3:10
4:10	3:50
4:50	4:30
5:30	5:10
	5:45

NOTE: No Service on Saturdays, Sundays or Holidays.

GRAFTON — COPELAND

WEEKDAY	
OUTBOUND	INBOUND
<i>Lv. Downtown</i>	<i>Lv. Copeland St.</i>
<i>School St.</i>	
8:25 a.m.	7:45 a.m.
9:25	8:40
10:25	9:40
	10:40
12:05 p.m.	12:20 p.m.
1:05	1:20
2:05	2:20
3:05	3:20
4:05	4:20
5:05	

NOTE: No service on Saturday, Sunday, or Holidays.

ASHLAND HEIGHTS

WEEKDAY	
OUTBOUND	INBOUND
<i>Lv. Downtown</i>	<i>Lv. N. Quincy and Court Sts.</i>
<i>Main St.</i>	
8:00 a.m.	8:10 a.m.
8:55	9:10
9:55	10:10
11:55	11:40
2:35 p.m.	2:50 p.m.
3:35	3:50
4:35	4:50

NOTE: No service on Saturday, Sunday, or Holidays.

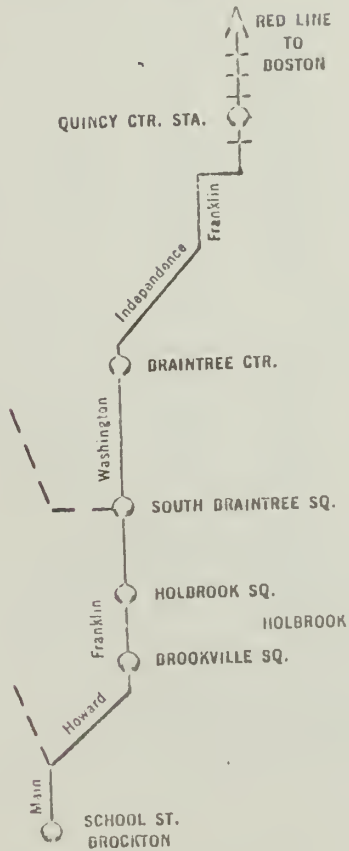
Brockton-Rockland Route
Crocker Transit Systems, Inc.

FROM School St.	TO	TIME Leaving
M&S	Rockland	7:00
Rockland	Brockton	7:30
Brockton	Rockland	8:00
Rockland	Brockton	8:30
Brockton	Rockland	9:00
Rockland	Brockton	9:30
Brockton	Rockland	10:00
Rockland	Brockton	10:30
Brockton	Rockland	11:00
Rockland	Brockton	11:30
Brockton	Rockland	12:00
Rockland	Brockton	12:30
Brockton	Rockland	1:00
Rockland	Brockton	1:30
Brockton	Rockland	2:00
Rockland	Brockton	2:30
Brockton	Rockland	3:00
Rockland	Brockton	3:30
Brockton	Rockland	4:00
Rockland	Brockton	4:30
Brockton	Rockland	5:00
Rockland	Brockton	5:30

230

BROCKTON — QUINCY CTR. STA.

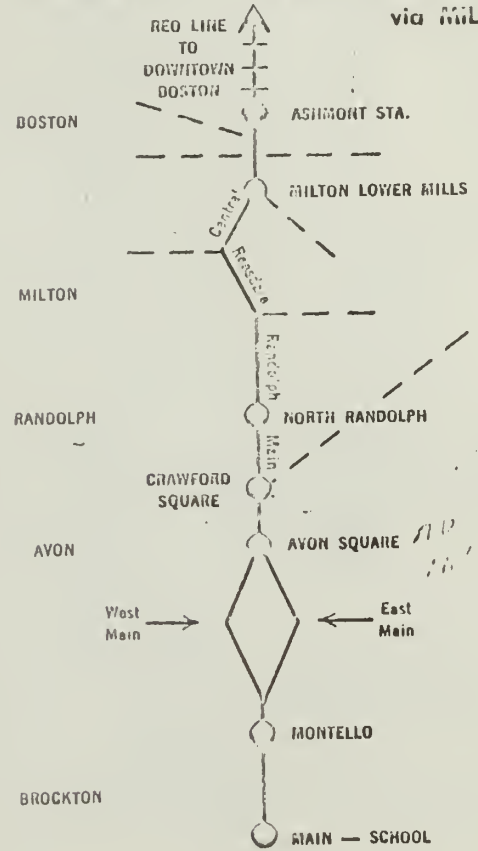
via HOLDBROOK



240

**BROCKTON — ASHMONT STA.
RANDOLPH — ASHMONT**

via MILTON



ROCKTON - QUINCY CTR. STA.

10. *Journal of the American Medical Association*, 2000; 283: 2686-2692.

H. To Holbrook Sq.

No service to or from Brockton on Sundays or Holidays

HOLIDAYS:

Oct. 23 - see SATURDAY service.

Oct. 11 - Nov. 2d - Dec. 25 - see SUNDAY service.

For information call: Quincy 472-3450 — Boston 722-5000

Performance of schedules subject to traffic delay.

*LAP (5M) Effective 9/7/74



BROCKTON — ASHMONT STA.

Note: m Via East Main Street, Avon
All other trips via West Main Street.

HOLIDAYS:
 Oct. 21 see SATURDAY service
 Oct. 14 - Nov. 28 - Dec. 25
 see SUNDAY service.

RANDOLPH — ASHACONT

NOTE: Additional service operated
from Ashmont Sta. to Randolph
on weekdays between 5:00 and 6:00 p.m.

For information call: Quincy 472-3450 — Boston 722-5000

240 MAP (7M) Effective 9/7/74

Unionville (24th & 25th Sts.)

EASTON - BROCKTON
BUS SCHEDULE

EFFECTIVE DECEMBER 1, 1972

Leave Crossroads Cafe	Leave Depot & Center Sts.	Leave N. Easton Center
7:15 A.M.	7:20 A.M.	7:25 A.M.
8:00 A.M.	8:05 A.M.	8:10 A.M.
11:15 A.M.	11:20 A.M.	11:25 A.M.
2:15 P.M.	2:20 P.M.	2:25 P.M.
4:30 P.M.	4:35 P.M.	4:40 P.M.
Lv. Brockton	Lv. Unionville	
7:45 A.M.	7:00 A.M.	
11:00 A.M.	8:20 A.M.	
2:00 P.M.	11:35 A.M.	
4:15 P.M.	2:35 P.M.	
5:40 P.M.	4:50 P.M.	

Lv. Elise Circle

8:15 A.M.
11:30 A.M.
2:30 P.M.

CHARTER COACH SERVICE TO ALL AMERICA & CANADA

Interstate Coach

Stoughton - Taunton

(19)

STOUGHTON TO BROCKTON

New Time Schedule Effective Nov. 20th

Lv. Stoughton	Lv. Brockton
x 6:00	x 6:25
7:00	7:25
8:00	8:25
9:00	9:25
10:00	10:25
12:00	12:45
1:30	2:15
3:00	3:45
4:30	5:15
6:00	6:30

x Except Saturday

No Service on Sundays and Legal Holidays

Daily, except Sundays and legal holidays

INTERSTATE COACH

1138 Washington St. Stoughton, Mass.
Tel. 344-2231

BELMONT STREET

Leave Brockton Center	Leave Marshall's Corner
7:45 A.M.	7:35 A.M.
9:00 A.M.	8:30 A.M.
10:30 A.M.	9:15 A.M.
11:00 A.M.	10:45 A.M.
1:30 P.M.	11:45 A.M.
2:00 P.M.	1:45 P.M.
3:00 P.M.	2:45 P.M.
3:30 P.M.	3:15 P.M.
4:15 P.M.	3:45 P.M.
5:40 P.M.	5:00 P.M.

Monday Thru Saturday
(NO SUNDAYS OR HOLIDAYS)

All Trips In Both Directions

VIA V. A. HOSPITAL

(OVER)

BOSTON BROCKTON COMMUTER SCHEDULE

Plymouth & Brockton Street Railway Company

749-5067 Boston

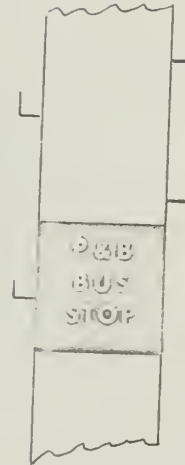
588-2228 Brockton

Schedules Effective October 12, 1974

Leave Boston				Leave Brockton			
Monday thru Friday Ex. Holidays		Saturdays Except Holidays		Monday thru Friday Ex. Holidays		Saturdays Except Holidays	
AM		AM		AM		AM	
Park Sq.	Essex Term.	Park Sq.	Essex Term.	BROCKTON School and Main Sts.	West- Gate Mall	BROCKTON School and Main Sts.	West- Gate Mall
8 00	8 10	9 00	9 10	6 15	6 25	7 15	7 25
9 00	9 10			6 45	6 55	10 30	10 40
10 30	10 40			7 15	7 25		
				7 45	7 55		
				9 00	9 10		
				10 30	10 40		
PM		PM		PM		PM	
12 01	12 10	12 01	12 10	12 01	12 10	1 30	1 40
1 30	1 40	3 20	3 30	1 30	1 40	4 30	4 40
3 20	3 30	5 35	5 45	3 00	3 10		
4 40	4 50			4 30	4 40		
5 05	5 15						
5 35	5 45						
6 30	6 20						

Running time to Brockton 50 mins.

NOTE: Park Square stop is opposite Trailways Terminal.

Commuter Books Available at Essex Terminal and also
at Park Square during P.M. Commuting Hours.PLEASE USE
DESIGNATED
BUS STOP

BROCKTON-BOSTON									
10-12 74									
2458									
Brockton, Mass. School & Main Streets..... Ar									
Brockton Westgate Mall.....									
Boston, Mass. Essex Term. (Opp. So. Sta.)Lv									
Park Sq. (Opp. Trilwys. Ter.)Lv									
READ DOWN									
518 ESu PM	516 EssH PM	514 ESu PM	512 EssH PM	510 ESu AM	508 EssH AM	506 EssH AM	504 ESu AM	502 EssH AM	500 EssH AM
4 30	3 00	1 30	12 01	10 30	9 00	7 45	7 15	6 45	6 15
4 40	3 10	1 40	12 10	10 40	9 10	7 55	7 25	6 55	6 25
5 25	3 55	2 25	12 55	11 25	9 55	8 40	8 15	7 45	7 05
5 35	4 05	2 35	1 05	11 35	10 05	8 50	8 25	7 55	7 15
READ UP									
501 EssH AM	503 ESu AM	505 EssH AM	507 ESu PM	509 EssH PM	511 ESu PM	513 EssH PM	515 EssH PM	517 ESu PM	519 EssH PM
8 50	9 50	11 20	12 50	2 20	4 10	5 40	6 05	6 35	7 10
8 40	9 40	11 10	12 40	2 10	4 00	5 30	5 55	6 25	7 00
8 10	9 10	10 40	12 10	1 40	3 30	4 50	5 15	5 45	6 20
8 00	9 00	10 30	12 01	1 30	3 20	4 40	5 05	5 35	6 30

DAVID NORMAN & CO., INC. **Express Buses**

Monday through Saturday
 Leave Dorchester Leave Ashmont

XS 6:40 a.m. 5:00
 XS 7:05 † 11:40
 1:00 p.m.
 XS 7:55 † 3:00
 10:25 X 5:00
 † 12:25 p.m.
 2:25 XS 5:00
 † 4:25 S 6:00

X Runs Express Between Rte. 18 So. Wey.
 and Ashmont
 S Does Not Run Saturday

No Service Sundays or Listed Holidays

CHARTERED BUSES
 For All Occasions

For Information and Reservations
 TEL. EDgewater 5-2004

DAVID NORMAN & CO., INC. **Express Buses**

Monday through Saturday
 Leave Col. Sq. Leave Ashmont

S 6:35 a.m. S 7:10 a.m.
 XS 7:00 OS 7:40
 S 7:30 S 8:15
 XS 8:00
 8:30 9:00
 9:30 10:00
 10:30 11:00
 † 11:30 † 12:00
 12:30 p.m. 1:00 p.m.
 † 1:30 † 2:00
 2:30 3:00
 3:30 4:00
 4:30 5:00
 S 5:30
 6:00
 5:30 6:00

X Runs Express Between Rte. 18 So. Wey.
 and Ashmont
 S Does Not Run Saturdays
 † Saturday Only
 Sundays and Listed Holidays:
 See So. Wey.-So. Dorch.-Ashmont
 Schedule

DAVID NORMAN & CO., INC. **Express Buses**

EFFECTIVE DECEMBER 30, 1974

OFFICE
 530 Broad Street, East Weymouth, Mass.
 Information: Tel. ED 5-2004

Holidays referred to in Time Table

New Year's Day
 Memorial Day
 Independence Day
 Labor Day
 Columbus Day
 Veterans' Day
 Thanksgiving Day
 Christmas Day

(Schedule for other holidays
 will be posted in buses.)

This company is not responsible for time
 table errors, inconvenience, or damage
 resulting from delayed coaches. Schedules
 are subject to change without notice.

DAVID NORMAN & CO.

1 HOLLIS STREET SOUTH WEYMOUTH
 Telephone EDgewater 5-2100



Whitman-Ashmont

Monday through Saturday

Leave Whitman	Leave Abington	Leave No. Abington
XS 6:20 a.m.	XS 6:25 a.m.	XS 6:30 a.m.
XS 7:35	XS 7:40	XS 7:45
10:00	10:10	10:20
† 12 noon	† 12:10 p.m.	† 12:20 p.m.
2:00	2:10	2:20
† 4:00	† 4:10	† 4:20

LEAVE ASHMONT FOR

Whitman	Abington	No. Abington
9:00	9:00	9:00
† 11:00	† 11:00	† 11:00
1:00 p.m.	1:00 p.m.	1:00 p.m.
† 3:00	† 3:00	† 3:00
5:00	5:00	5:00
XS 5:30	XS 5:00	XS 5:30
S 6:00	S 6:00	S 6:00

X Runs Express Between Rte. 13 So. Wey.
and Ashmont

S Does not run on Saturday

No Service Sundays or Listed Holidays

Rockland-Ashmont

Monday through Saturday

* Leave Rockland	Leave Ashmont
S 6:20 a.m.	
S 7:15	S 7:40
S 8:15	
	† 10:00
	S 11:00
† 11:15	† 12:00 noon
S 12:15	
† 1:15 p.m.	† 2:00 p.m.
	S 3:00
† 3:15	† 4:00
S 4:15	XS 5:00
	S 5:30
† 5:15	† 6:00

X Runs Express Between Rte. 13 So. Wey.
and Ashmont

S Does not run Saturdays

† Saturday Only

* Time buses leave Rockland Town Hall

So. Weymouth to So. Plainfield

Ashmont

VIA ROUTE #128
Monday through Saturday

Leave Columbian Sq.	Leave So. Braintree	Leave Ashmont
S 6:35 a.m.	S 6:45 a.m.	S 7:10
	S 7:40	7:40
S 7:30		S 8:15
8:30	8:40	9:00
9:30	9:40	10:00
10:30	10:40	11:00
† 11:30	† 11:40	† 12:00 noon
12:30 p.m.	12:40 p.m.	1:00 p.m.
† 1:30	† 1:40	† 2:00
2:30	2:40	3:00
3:30	3:40	4:00
4:30	4:40	5:00
		S 5:30
5:30	5:40	6:00

DOWNTOWN MINI BUS SERVICE

Campello High Rise

Daily No Saturday

Starts January 4, 1975

Lv. Campello High Rise--Main Door

Lv. School St. For Campello

For Downtown

High Rise Via the Perkins--
Southfield Bus

8:35 am

9:55

11:15

1:15 pm

3:15

4:35

9:30 am

10:50

12:50 pm

3:30

4:50

note: This bus will stop in front of the Main Door, A Bldg.

For Information Call 586-3661

Served by regular Perkins - Southfield run

SATURDAY SHOPPERS BUS

TO: Fernandes, Big 'G', B P M

L V. C A M P E L L O H I G H R I S E 9:30 am.

E T U R N . F R O M B P M & B I G 'G' 11:30 am.

F R O M F E R N A N D E S 11:35 am

TO Campello High Rise

effective: Saturday January 4, 1975

Saturday Only

DOWNTOWN MINI BUS SERVICE

CAFFREY

TOWERS

Lv. CAFFREY TOWERS--MAIN DOOR
A Bldg.
 FOR DOWNTOWN

Lv. DOWNTOWN FOR CAFFREY TOWERS

VIA CRESCENT ST.

9:05 am	9:00 am
10:05	10:00
11:05	11:00
12:05 pm	12:00 n
1:05	1:00
2:05	2:00
3:05	3:00
4:05	4:00

MONDAY--FRIDAY

No Saturdays

FOR INFORMATION CALL 586-3661

Served by regular Crescent run



MASS. Y3. C21: 2B78/2/n. 2-

TECH
MEMO 2

PROCHYTH WITH TRAVELT SP-01

CONTRACT MEMORANDUM

QUALITY OF WORK

2000-01-01
2000-01-01
2000-01-01
2000-01-01

2000-01-01 (2000-01-01)

2000-01-01

2000-01-01 (2000-01-01)

Brockton Area Transit Study

Technical Memorandum #2

ANALYSIS OF SURVEYS

January 2, 1975

Introduction

A number of surveys were conducted as part of the Brockton Area Transit Study. The three major surveys conducted were the Bus Passenger Survey, which was conducted to determine the bus ridership by route for the local service, and a variety of characteristics concerning the present riders, the second survey conducted was the Home Interview Survey, conducted to obtain statistics concerning the average number of trips made by residents of the area for various purposes and by various modes. This survey was conducted in four towns including Brockton, during the months of July and August, and included 263 families. The third major survey conducted was an Attitude/Latent Demand Survey. This survey was mailed to a random sample of 5% of the families in the region and was intended to obtain citizen attitudes towards the present service and types of improvements they would like to see made in addition to obtaining statistics concerning the areas where service should be expanded.

In addition, a number of other supporting surveys were conducted, including a survey of elderly transportation needs and attitudes, Spanish-speaking citizens attitudes, and a survey of transportation services provided by special service agencies such as Self Help and the Home Care Center. It is the intent of this Technical Memorandum to summarize the data collected and developed as part of those surveys.

BUS PASSENGER SURVEY

Bus Passenger Surveys

The Bus Passenger Survey for the Crocker service was conducted on October 22, 1974 on all of the routes for the full day of operation. A more complete discussion of the techniques and procedures can be found in Staff Paper No. 1 . The survey for Interstate Coach Company service was conducted on November 12, 1974 for its two bus routes, however, the data collected on the Easton - Brockton route required additional analysis to determine its validity, and therefore the data for that one bus operation was discarded and an On/Off Survey was conducted on November 26, to supplement the missing statistics. Ridership on the other companies which are, for the most part, inter-regional, was collected by on/off counts at specific locations and through head counts made by the companies themselves.

Ridership Statistics

Table 1 is a summary of average daily ridership in the planning region during the months of October and November. Table 2 is a summary of bus riders by route for the Crocker Transportation Company and compares the ridership on the day of the survey with the average route ridership for three days in April, 1973. The April, 1973 data included a significant fluctuation in ridership from one day to the other. The total (approximately 2200 people) transported on the day of the survey is close to the April, 1973 survey even though ridership has been increasing since that time. Table 3 is a summary of ridership for November 26, 1974 for the Interstate Coach Company and for the Plymouth-Brockton Street Railway Company, which is an inter-regional carrier.

Table 4 is a summary of the ridership on the MBTA's Brockton - Ashmont run. The counts were made on November 12, 1974 by individuals located at Main and School in Brockton and at Avon Square. Table 5 is a summary of the ridership on the MBTA's Brockton - Quincy run, made on November 12, 1974 at Main and School in Brockton. Table 6 is a summary of the Brockton area users of the Brush Hill Company service to Boston. Table 7 is a summary of the Hudson Limousine Service from Brockton - Westgate Mall to Logan International Airport.

Table 1

Summary of Bus Ridership

<u>Operator</u>	<u>Passengers</u> ¹
Crocker Transportation	2244
Interstate (Unda)	178
Plymouth & Brockton	255
MBTA	723
Brush Hill	319
Hudson Limousine	14
Almeida	<u>515</u>
	4248

1 Passengers are for day of survey

5
Table 2

Bus Ridership - Crocker

Route #		April '74 3-day Avg.	Oct '74 ² Survey	School Trips	Total
1	Montello/Campello	814	680		680
2	Centre/Crescent	259	301	80 ³	381
3	Belmont/Pleasant	658 ¹	444	144 ⁴	588
4	Perkins/Ames	198	275	42 ⁵	317
5	Copeland/Ashland	<u>146¹</u>	<u>54</u>	<u>106⁶</u>	<u>170</u>
		2075	1754	372	2166
6	Senior Citizens				45
7	Brockton/Rockland		73		<u>73</u>
	Brockton/Whitman				2244

D i s c o n t i n u e d

- 1 Includes school trips
- 2 Does not include school trips
- 3 East Junior High School
- 4 West Junior High School
- 5 South Junior High School
- 6 West and North Junior High Schools and Brockton High School

Table 3

Ridership - Interstate

Stoughton/Brockton	104
Easton/Brockton	74

Ridership - Plymouth & Brockton Street Railway Co.

Outbound	133
Inbound	122

School Bus Ridership - Monday, November 25, 1974

Provided by the Transportation Authority

(to and from school)

	<u>Riders</u>	
South Junior High	42	
(Run 11, Perkins Avenue)		
Brockton High	54	
(Run 13, Belmont/Pleasant)		
North Junior High	70	
(Run 15, Copeland)		
East Junior High	80	
(Run 12, Crescent)		
West Junior High		
Route 1, Torrey and Pearl	36	Run 13, Copeland
Route 2, Pleasant and Warner	60	Run 9, Pleasant
Route 3 Pleasant and Pearl	<u>30</u>	Run 10, Pleasant
	372	

MBTA Ridership

Data for 11/12/74

Ashmont to Brockton (Inbound)

	<u>Avon Square</u>	<u>Brockton M & S</u>
Picked Up	10	0
Dropped Off	17 ¹	138 ¹
Thru Stop Passengers	314	0
Off Between Avon Square and M & S		169 ¹

1) 324 riders using two count stations

Brockton to Ashmont (Outbound)

	<u>Brockton M & S</u>	<u>Avon Square</u>
Picked Up	176 ¹	22 ¹
Dropped Off	0	6 ¹
Thru Stop Passengers	0	248
On Between Avon Square and M & S		72 ¹

1) 276 riders using two count stations

7
Table 5

MBTA Ridership

Survey 11/12/74

Brockton/Quincy

	<u>6:00 AM to NOON</u>	<u>NOON to 8:00 PM</u>	<u>Total</u>
To Quincy			
on at M & S	32	38	70
From Quincy			
off at M & S	22	31	<u>53</u>

Total Passengers to/from Brockton M & S 123

Trip time from M & S to Quincy Center Station is approximately 40 minutes.

Almeida Bus Ridership

Survey 11/12/74

From Boston

Passengers off at: West Bridgewater	120
Bridgewater Center	<u>114</u>
	234

To Boston

Passengers on at: West Bridgewater	105
Bridgewater Center	<u>176</u>
	281
TOTAL	515

Table 6

BRUSH HILL TRANSPORTATION CO.

Stoughton Ridership For Tuesday, December 3, 1974

From Stoughton To Mattapan		From Mattapan To Stoughton	
Time Leaving	Number Of Riders From Stoughton	Time Leaving	Number Of Riders To Stoughton
7:00 A.M.	<u>30</u>	6:30 A.M.	<u>6</u>
8:00 A.M.	<u>23</u>	7:30 A.M.	<u>9</u>
9:00 A.M.	<u>11</u>	8:30 A.M.	<u>5</u>
10:00 A.M.	<u>16</u>	9:30 A.M.	<u>4</u>
11:00 A.M.	<u>6</u>	10:30 A.M.	<u>4</u>
1:00 P.M.	<u>5</u>	12:30 P.M.	<u>12</u>
2:00 P.M.	<u>8</u>	1:30 P.M.	<u>14</u>
3:00 P.M.	<u>14</u>	2:30 P.M.	<u>17</u>
4:00 P.M.	<u>6</u>	3:30 P.M.	<u>21</u>
5:00 P.M.	<u>3</u>	4:30 P.M.	<u>30</u>
6:00 P.M.	<u>4</u>	5:30 P.M.	<u>54</u>
7:00 P.M.	<u>3</u>	6:30 P.M.	<u>14</u>
	129		190

9
Table 7

HUDSON LIMOUSINE SERVICE

Ridership for Tuesday, November 12, 1974

From Brockton To Logan		From Logan To Brockton	
Time Leaving	Number of Riders	Time Leaving	Number of Riders
5:30 A.M.	<u>0</u>	8:15 A.M.	<u>0</u>
6:45 A.M.	<u>1</u>	9:15 A.M.	<u>1</u>
7:45 A.M.	<u>3</u>	10:15 A.M.	<u>0</u>
8:45 A.M.	<u>1</u>	12:15 P.M.	<u>0</u>
9:45 A.M.	<u>0</u>	1:15 P.M.	<u>2</u>
10:45 A.M.	<u>2</u>	2:15 P.M.	<u>0</u>
11:45 A.M.	<u>0</u>	3:15 P.M.	<u>0</u>
12:45 P.M.	<u>0</u>	4:15 P.M.	<u>0</u>
1:45 P.M.	<u>0</u>	5:15 P.M.	<u>0</u>
2:45 P.M.	<u>0</u>	6:15 P.M.	<u>0</u>
3:45 P.M.	<u>0</u>	8:15 P.M.	<u>1</u>
4:45 P.M.	<u>3</u>	10:15 P.M.	<u>0</u>
5:45 P.M.	<u>0</u>		4
6:45 P.M.	<u>0</u>		
7:45 P.M.	<u>0</u>		
8:45 P.M.	<u>0</u>		
	10		

Copeland/Ashland Route

The Bus Passenger Survey conducted October 22, 1974 resulted in no passengers on the Copeland/Ashland run from 2:00PM until the service ended at 5:30 PM. It was therefore concluded by the staff that an On/Off count be conducted by a member of the staff. On November 20, 1974, the count was made, and Table 8 reflects the ridership for that period of time. Ridership estimates for the route were adjusted, using these statistics.

Table 8

Summary of On-Off Counts Used to Check On-Board Survey

Copeland/Ashland		11/20/74	Rainy	
<u>Time</u>	<u>Leaving</u>	<u>To</u>	<u>On Count</u>	<u>Hour Total</u>
2:05	M and S	Copeland	6	
2:20	Copeland	Ashland	1	
2:50	Ashland	Copeland	5	12
3:20	Copeland	Ashland	1	
3:50	Ashland	Copeland	7	8
4:20	Copeland	Ashland	3	
4:50	Ashland	M and S	0	3

Ridership by Time of Day

To assist in analyzing the need for vehicle size, the data collected from the On-Board Passenger Survey was summarized by hour. The summary was made by the time the bus left the terminus of the trip. That is, all buses on the Montello/Campello route leaving either Montello or Campello between 6:00 and 6:59 were accumulated for the 6:00 to 7:00 period. Figures 1 through 6 display the total ridership on each route by hour. Figure 7 is a summary of ridership by hour for all routes combined.

Figures 1 and 3 show that the Belmont/Pleasant Street and the Montello/Campello runs have the highest ridership in the city. In order to better determine the need for the size of new buses, it was decided to perform on/off counts on these two routes. The routes were laid out on a large-scale map and strategic points along the route were identified. The surveyor then recorded the number of people getting on and getting off the bus between each of these stops. Table 9 is the summary of the highest route runs from the Bus Passenger Survey. Figures 8 to 10 display the number on riders on board a bus at any one time.

BATS Bus Ridership Study

Trips per hour by route

October 22, 1974

Route - 1 Montello/Campello

Does Not Include School Runs

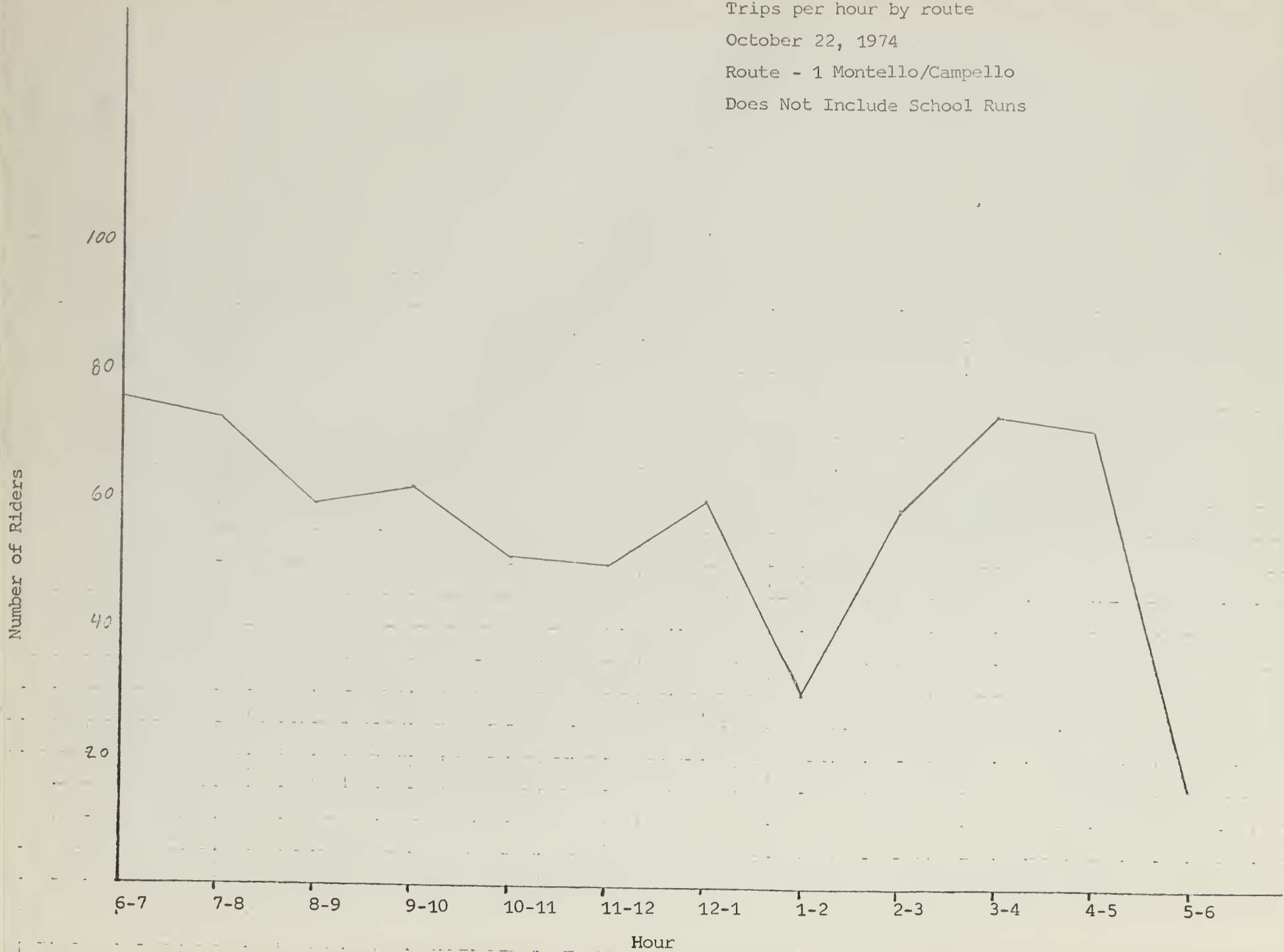


Figure 1

FATS Bus Ridership Study

Trips per hour by route

October 22, 1974 .

Route - 2 Center/Crescent

Does Not Include School Runs

Number of Riders



Figure 2

BATS Bus Ridership Study

Trips per hour by route

October 22, 1970

Route - E Belmont/71st Ave

Does Not Include School Buses

Number of Riders

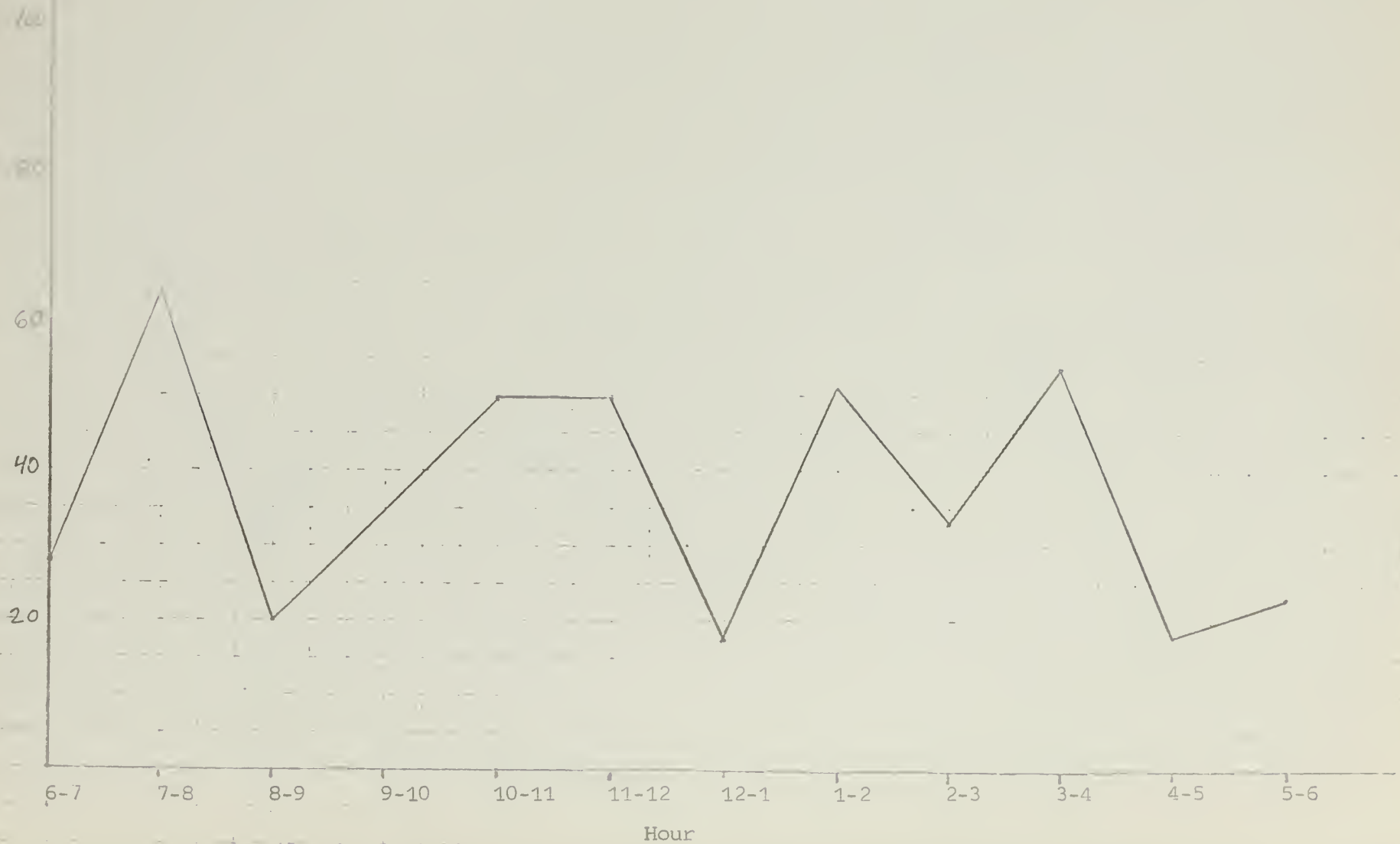


Figure 3

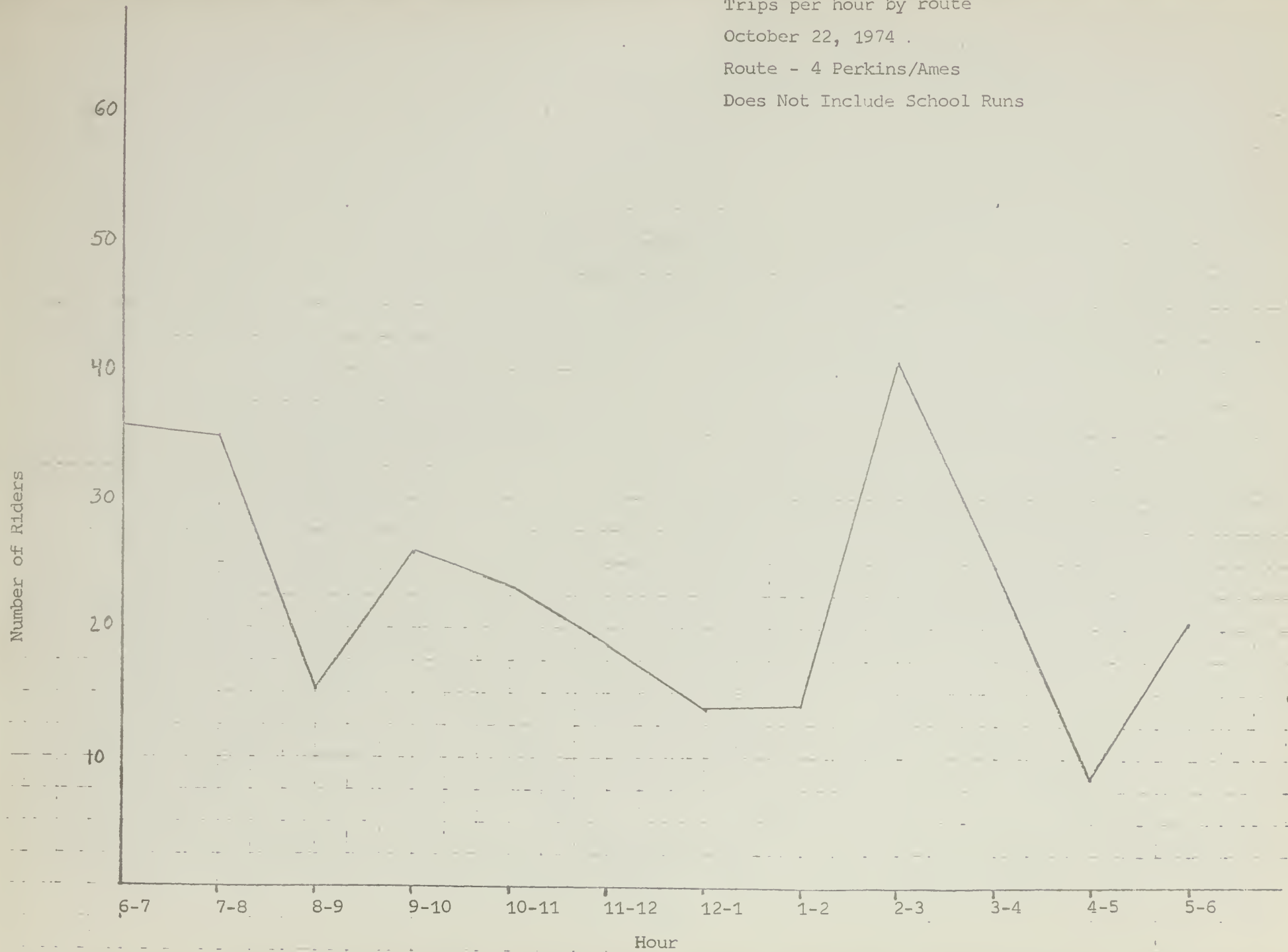
BATS Bus Ridership Study

Trips per hour by route

October 22, 1974 .

Route - 4 Perkins/Ames

Does Not Include School Runs



Trips per hour by route

October 22, 1974 .

Route - 5 Copeland/Ashland

Does Not Include School Runs



Trips per hour by route

October 22, 1974 .

Route - 7 Brockton/Rockland

Does Not Include School Runs

Number of Riders

30

20

10

6-7

7-8

8-9

9-10

10-11

11-12

12-1

1-2

2-3

3-4

4-5

5-6

Hour

Figure 6

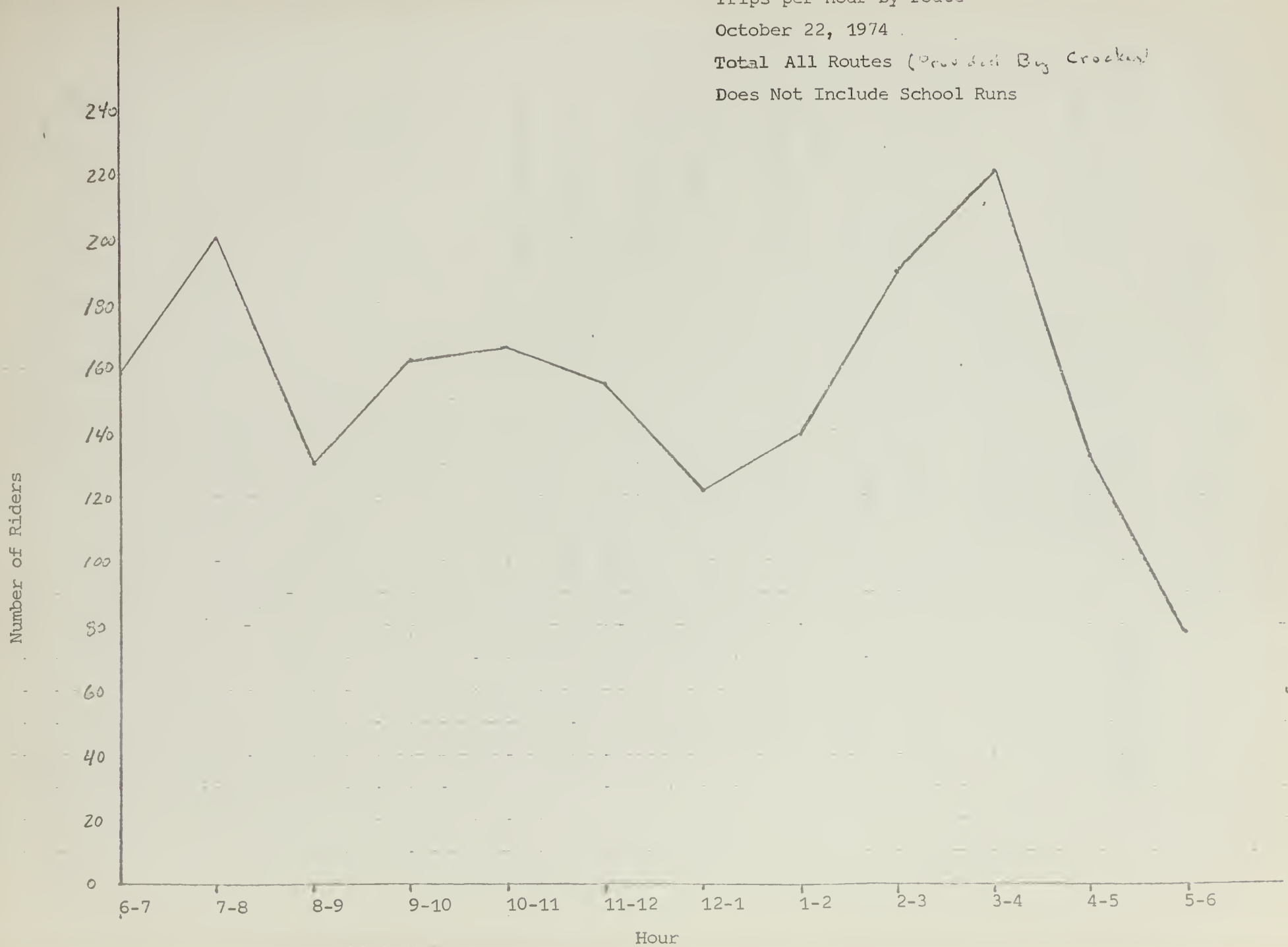
BATS Bus Ridership Study

Trips per hour by route

October 22, 1974

Total All Routes (Provided By Crockett)

Does Not Include School Runs



19
Table 9

Highest Ridership by Route and Run

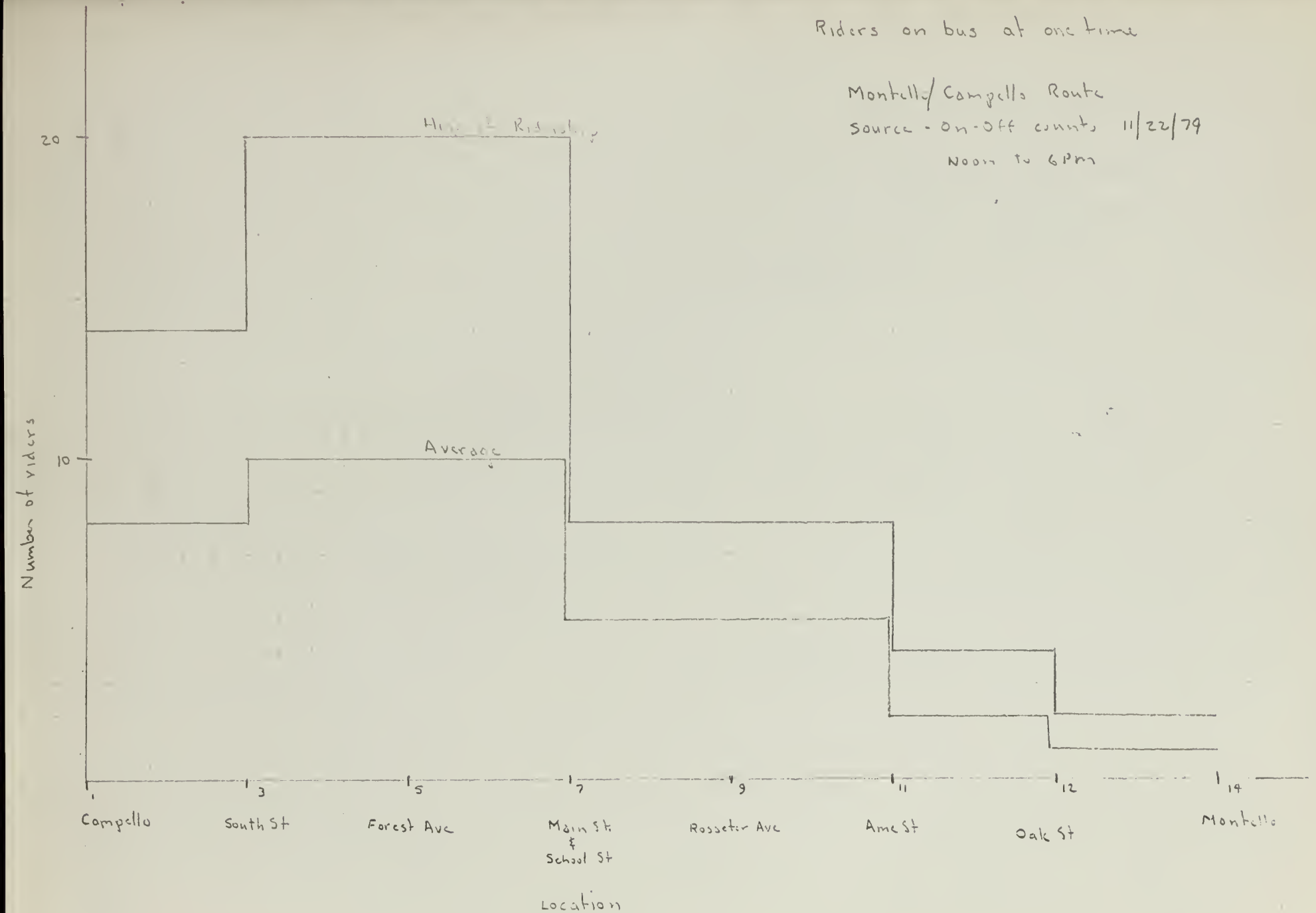
<u>Route</u>		<u>Run</u>	<u>Number of Riders</u>
1	Montello/Campello	6:15 AM to Campello	24
		7:15 AM to Campello	24
		12:15 PM to Montello	24
		48 Runs	
2	Centre/Crescent	1:15 PM to Centre	15
		2:45 PM to Crescent	15
		49 Runs	
3	Pleasant/Belmont	7:50 AM to Belmont	23
		2:30 PM to Pleasant	25
4	Perkins/Ames	2:50 PM to Perkins	15
5	Copeland/Ashland	8:40 AM to Ashland Heights	10
		9:40 AM to Ashland Heights	10
6	Senior Citizen	11:00 AM to Main & School	26
7	Brockton/Rockland	3:00 PM to Rockland	9

Riders on bus at one time

Montello/Campello Route

Source - On-Off counts 11/22/79

Noon to 6 PM

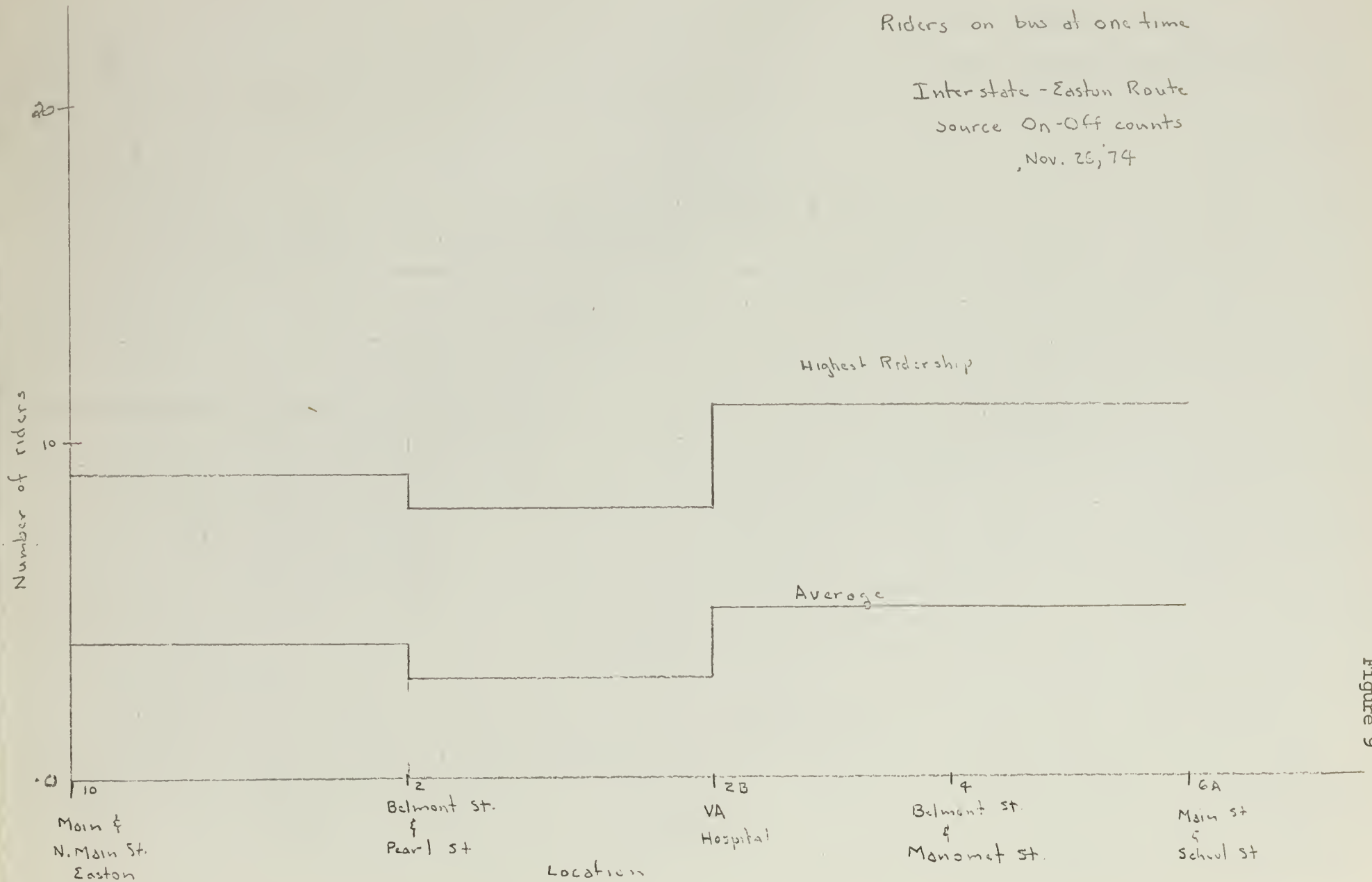


Riders on bus at one time

Interstate - Easton Route

Source On-Off counts

, Nov. 26, '74



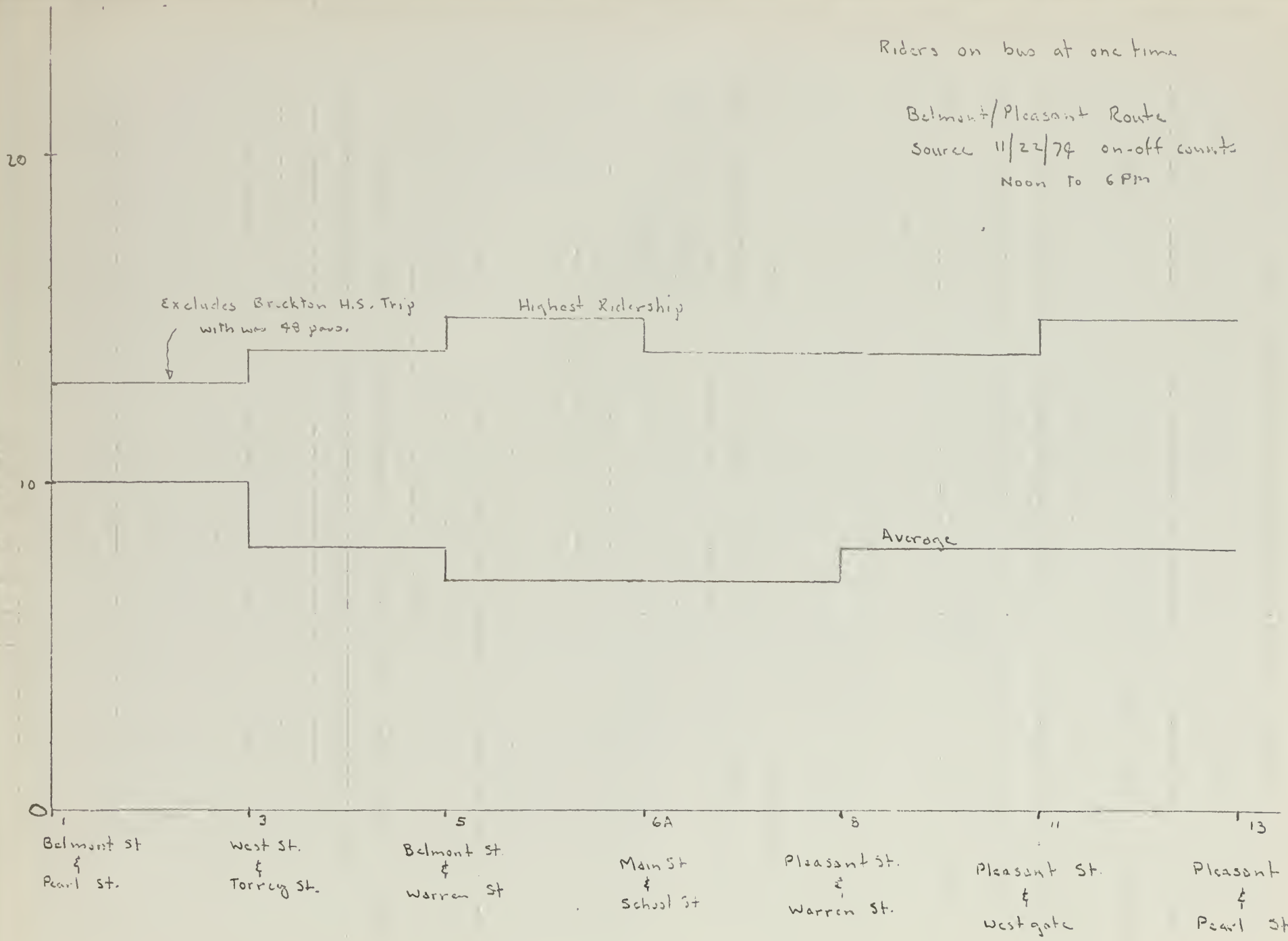
Riders on bus at one time

Belmont/Pleasant Route

Source 11/22/74 on-off counts

Noon To 6 PM

Number of Riders



Ridership per Bus Mile

A reasonably well-established measurement of the efficiency and effectiveness of local bus service is the ridership per bus mile statistic which is easily calculated. Simply, it is the summary of passengers carried for an average day on a specific route divided by the total miles of bus miles needed to provide service. Miles include the deadhead miles, that is, the miles the bus must travel to start the revenue service from the garage, and the miles at the end of the day from revenue service back to the garage. Table 10 is a summary of passengers per route in-service or revenue miles and deadhead miles and the statistic ridership per bus miles.

The greater the ratio, the more effective the service. This statistic does not indicate the average number of people on the bus, which is related directly to the average trip length of the individual, but is used to indicate what the per-mile revenue of the route is in comparison to the cost of providing service on that route. That data will be developed in the future.

It is interesting to note from this data that the Montello/Campello route is the highest utilized route with a ratio of 2.6 and the Easton-Brockton is the lowest with a ratio of only 0.5.

Table 10

Ridership Per Bus Mile

Average Weekday October 1974

Route	Miles of Bus Operation			Riders (Survey)	Riders/ Total Miles
	In Service	Deadhead	Total		
Montello/Campello	255.4	2.6	258.0	680	2.6
Centre/Cresent	223.6	2.6	226.2	341	1.5
Pleasant/Belmont	245.3	5.0	250.3	489	2.0
Perkins/Ames	362.3	5.1	367.4	296	0.8
Copeland/Ashland	103.9	5.2	109.1	169	1.6
Brockton/Rockland	187.0	1.0	188.0	73	0.4
Senior Citizen	15.8	0.0	<u>15.8</u>	<u>45</u>	<u>2.8</u>
			1414.8	2093	1.4
Easton/Brockton (Unda)	136.7	?		74	0.5
Stoughton/Brockton (nda)	<u>129.0</u>	?		<u>108</u>	<u>0.8</u>
	265.7			178	0.7

Excludes school trip miles and riders

On-Board Survey Statistics

The On-Board Survey conducted resulted in approximately 1200 survey forms filled out, coded, keypunched and summarized for the study. Table 11 is a summary of a variety of statistics from the survey. Following are comments concerning those statistics:

How did you get to the bus stop?

Approximately 49% walked only one block while an additional 25% walked two blocks, accounting for nearly 3/4s of the riders. This statistic is very similar to statistics developed in other surveys, that is, if fixed-schedule service is provided, it must be within two city blocks of the user's place of residence. This statistic suggests that bus routes should be rather close together, approximately four blocks in the more heavily populated areas.

What is the main purpose of your trip?

Work trips accounted for 42% of the rider's travel. This is a considerably lower percentage than many areas similar to the Brockton area. Some areas are as high as 75%. From one point of view, it shows that service is being utilized throughout the day and the system is not built around the peak hours which lends itself to low revenue service in the off-peak hours and a large number of buses in the peak periods. It does suggest that there is a need to increase ridership in the peak periods for work trips.

Captive Ridership

Captive ridership is defined as that rider who has no other modal choice in making a trip other than using bus service. That is, it is an individual without a driver's license or without an automobile available, either of these for a variety of reasons. The statistics shown in the tables under "Do you have a driver's license?" and "If you have a license, was an automobile available for your use?" show that the captive ridership is at a minimum, 84% of the riders using the service. This is not unusual for operations the size of the Brockton area, but does emphasize the need to develop a system which will encourage non-captive riders or decision

riders to utilize the service.

What is your age

The 26% over 65 years old is a lower percentage than most staff members believed was the case.

What is your sex?

The 73% female is, to some extent, directly related to the "captive" rider type of statistic. That is, if cross tabulations were made, it is likely that a high percentage of the females would lack either the availability of an auto or driver's license. Many of them are probably the second worker in one car families or are individuals on shopping trips in families with only one car.

Table 11

Brockton Area Transit Study

Preliminary Summary of On-Board Survey for Crocker Transportation Co.

Riders on Day of Survey: 1754

Surveys Returned: 1144

65 % Returned

Results of Questions

How did you get to bus stop?

Walked one block	49%
Walked two blocks	25%
Walked 3+ blocks	18%
Drove	4%

What is the main purpose of your trip?

Work	42%
Shopping	29%
School	8%
Medical	7%
Social	4%

Do you have a driver's license?

Yes	22%
No	78%

How many autos are available in family?

None	55%
One	31%
Two	10%
Three	3%

If you have a license, was an automobile available for your use?

Yes	16%
No	84%

How often do you take the bus?

Daily	59%
1-4 times per week	20%
less	21%

What is your age?

Under 14	2%
15 to 19	16%
20 to 24	8%
25 to 34	10%
35 to 64	39%
Over 64	26%

What is your sex?

Male	27%
Female	73%

ANALYSIS OF HOME INTERVIEW

Home Interview Survey

Staff Paper No. 3 , "Home Interview Survey", documents the procedures, number of interviews per town, return rate, and other statistics concerning the Home Interview Survey. Table 12 displays specific statistics and data for the survey. The table shows that the average number of trips for a family is 7.8 trips for all modes, and 5.9 auto driver trips. This statistic is similar to trip generation statistics developed from similar types of surveys. The trip is defined as the movement from an origin to a destination as opposed to a round trip such as a trip from home to work and back home. That is defined as two trips in this statistic. The 5.9 auto driver trips per family multiplied by the total number of families in the study area would result in a total of 347,000 daily one-way trips generated by the residents of the study area. This is an interesting statistic when compared to the total of 3733 average daily bus trips in the region.

Table 12

Home Interview Summary

Number of Home Interviews

Brockton	207
Easton	29
Whitman	14
Stoughton	<u>15</u>
	265

	<u>Total Survey</u>	<u>Brockton</u>
All Trips	2,062	1,572
Auto Driver Trips	1,567	1,175
Auto Passenger Trips ¹	438	353
Bus Trips	24	23
Walk to Work	32	22
Other Trips	3	3
All Trips/Interview	7.8	7.6
Auto Driver Trips/Interview	5.9	5.7

1 Does not include children under 16

Table 13

Brockton Area Transit Study

Preliminary Home Interview Statistics

- <u>Income</u>	<u>Number of Households</u>	<u>%</u>
\$0-4999	37	14.6
5-7999	28	11
8-9999	24	9.4
10000-14999	72	28.4
15000-19999	56	22
20000 & over	<u>37</u>	<u>14.6</u>
	254	100.0

No answer 9
263

- Total Number of Bus Trips = 60

- Household with Licensed Drivers

<u>Drivers</u>	<u>Number of Households</u>	<u>%</u>
0	31	11.8
1	54	20.5
2	124	47.1
3	38	14.4
4	11	4.2
5	3	1.1
6	<u>2</u>	<u>.9</u>
	263	100.0

- Autos Available by Household

<u>Autos</u>	<u>Number of Households</u>	<u>%</u>
0	31	11.8
1	96	36.5
2	106	40.3
3	25	9.5

- Autos Available by Household (continued)

<u>Autos</u>	<u>Number of Households</u>	<u>%</u>
4	3	1.1
5	<u>2</u>	<u>0.8</u>
	263	100.0

- Structure Type of Interviewee

	<u>Number of Interviews</u>	<u>%</u>
Single family	171	65.0
2-3 family	51	19.4
Multi family	39	14.8
Trailer	1	.4
Institution	<u>1</u>	<u>.4</u>
	263	100.0

Home Interview Statistics

Interviews by Structure type

Single Family	171
2 or 3 Family	51
Multi-Family	39
Individual Trailer	1
Institution	<u>1</u>
	263

Type of Living Quarters

House	205
Apartment	57
Institution	<u>1</u>
	263

Number of persons living in dwelling unit

One	37
Two	59
Three	37
Four	67
Five	34
Six	16
Seven	3
Eight	6
Nine	2

Home Interview

Average persons per Dwelling Unit =

Census Data (1970)

OCPC = 3.45 persons per D.U.

Brockton = 3.21

Number of persons in DU with driver's license

None	31	
One	54	1.85 persons/D.U. have a driver's license
Two	124	
Three	38	
Four	11	
Five	3	
Six	2	

How many blocks to the nearest bus stop

One	102
Two or Three	49
Four or more	112

How many autos available for family use

None	31	
One	96	1.54 autos/D.U.
Two	106	
Three	25	
Four	3	
Five	2	

What is the range of annual income of family

\$0 to 4999	37
5000 to 7999	28
8000 to 9999	24
10000 to 14999	72
15000 to 19999	56
20000 and over	37

Brockton Area Transit Study

Summary of Home Interview Survey Comments

<u>Comment</u>	<u>Number of Comments</u>
<u>Bus Service</u>	
1. Improved Schedules and Frequency	45
2. Improved Bus Routing	6
3. Desire Smaller Buses	1
4. Improved Bus Service to Boston	8
4.1. Improved Rolling Stock	2
5. Improved School Bus Service	6
6. Satisfied with Present Service	4
7. Special Buses to Serve Elderly	5
<u>Train Service</u>	
1. Improved Train Service	14
<u>General Comments</u>	
1. Improve Downtown Traffic and Parking	7
2. Would Rather Use Auto	<u>7</u>
	105

LATENT DEMAND SURVEY

Brockton Area Transit Study

Partial Results of Latent Demand Survey

9. If bus/transit service were improved so that it would be possible to catch a bus/transit at least every fifteen minutes, and walking distances to bus/transit stops were five minutes or less, would members of your household use the bus/transit more often?

Check one: ☐ yes ☐ no

Yes 379 60%

No , 254 40%

630

11. How do you rate existing bus service?

Check one: ☐ Good ☐ Fair ☐ Poor
☐ No Opinion ☐ Not available

Good 40 6%

Fair 108 16%

Poor 214 32%

No Opinion 151 23%

Not Available 150 23%

663

12. What agency should be responsible for the operations of transit service?

Check one: ☐ Private Bus Companies
☐ State
☐ Combination of State and Town
☐ Transit Authority
☐ No Opinion

Private Bus Companies 224 35%

State 26 4%

Combination State/Town 115 18%

Transit Authority 130 20%

No Opinion 144 23%

639

3. Would you tolerate a small increase in local property tax to help support bus transit operations?

Check one: ☐ yes ☐ no ☐ don't know

Yes 109 17%

No 437 67%

Don't Know 105 16%
651

14. How many members of your household have a handicap which restricts their travel as an:

a. Auto driver _____ (number of persons)

b. Bus/transit passenger _____ (number of persons)

Auto Driver 66 persons

Bus/transit Passenger 37 persons

15. With regard to bus/transit service, how important do you rate each of the following factors? (Please mark one choice for each item.)

	Very Important	Fairly Important	Not Important
a. New Buses	<input type="checkbox"/> 18 %	<input type="checkbox"/> 53 %	<input type="checkbox"/> 29 %
b. Benches at most bus stops	<input type="checkbox"/> 30	<input type="checkbox"/> 32	<input type="checkbox"/> 38
c. New Bus Stop signs	<input type="checkbox"/> 45	<input type="checkbox"/> 32	<input type="checkbox"/> 23
d. More frequent service			
Rush hour	<input type="checkbox"/> 78	<input type="checkbox"/> 15	<input type="checkbox"/> 7
Mid-day	<input type="checkbox"/> 25	<input type="checkbox"/> 53	<input type="checkbox"/> 22
Evening	<input type="checkbox"/> 35	<input type="checkbox"/> 44	<input type="checkbox"/> 21
Weekend	<input type="checkbox"/> 26	<input type="checkbox"/> 45	<input type="checkbox"/> 29
e. Passenger shelters at major stops	<input type="checkbox"/> 41	<input type="checkbox"/> 39	<input type="checkbox"/> 20
f. Air-conditioned buses	<input type="checkbox"/> 21	<input type="checkbox"/> 34	<input type="checkbox"/> 45
g. A bus transit information service	<input type="checkbox"/> 57	<input type="checkbox"/> 32	<input type="checkbox"/> 11
h. Cleaner buses	<input type="checkbox"/> 56	<input type="checkbox"/> 38	<input type="checkbox"/> 6
i. Lower fares	<input type="checkbox"/> 45	<input type="checkbox"/> 42	<input type="checkbox"/> 13
j. Door to door service	<input type="checkbox"/> 11	<input type="checkbox"/> 31	<input type="checkbox"/> 58

16. Please indicate your family's annual income.

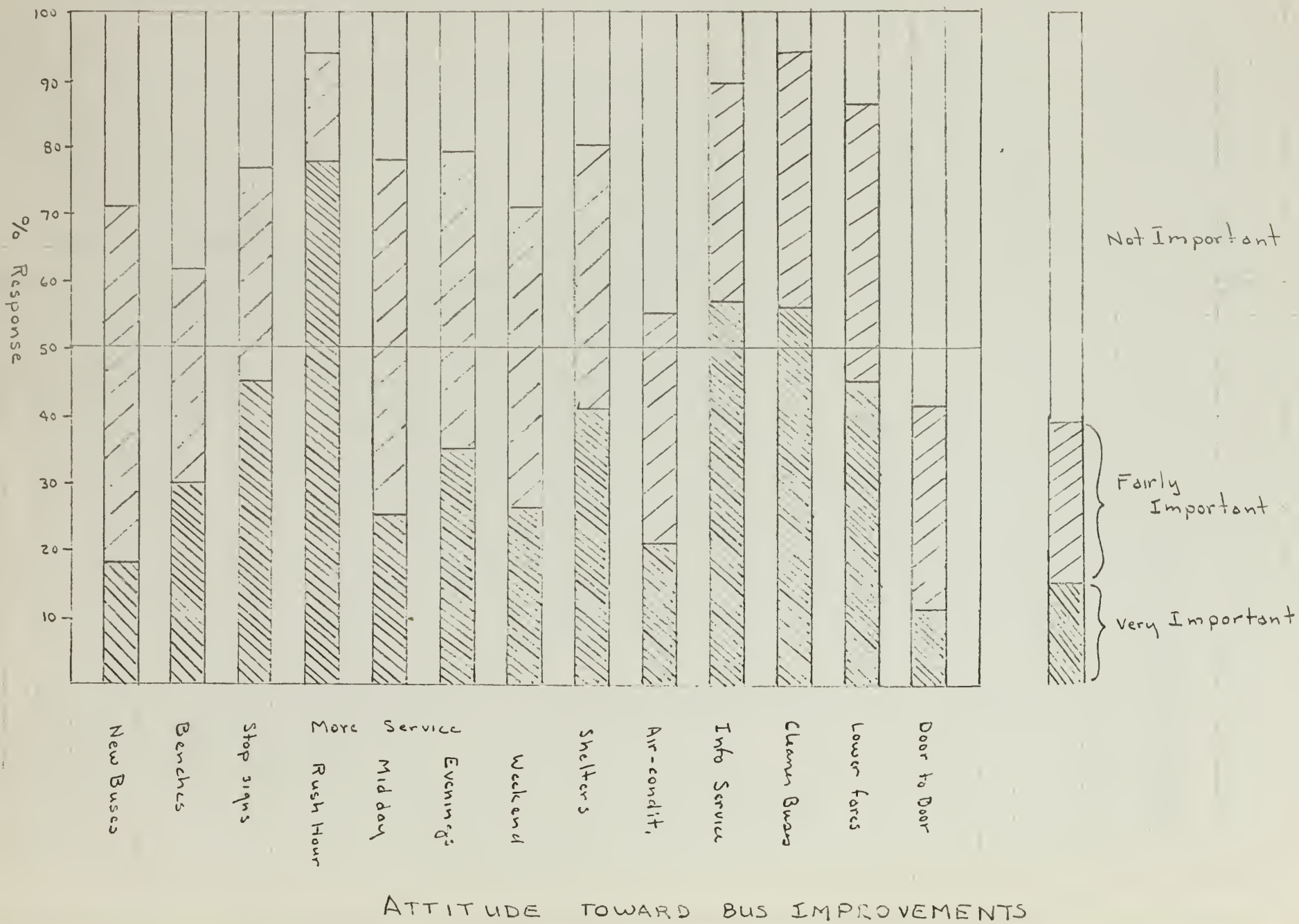
Check one: ☒ 5 % 0-4,999 ☐ 19 % 5,000-9,999 ☐ 76 % 10,000 or over

Brockton Area Transit Study

Latent Demand Survey

A mail out/mail back Attitude/Latent Demand Survey was conducted during August, September, and October, 1974. Staff Paper #4 summarizes the procedures and contains a copy of the questionnaire. The following pages contain some interesting attitudes toward bus service in the Old Colony region. Figure 11 is a display of specific bus improvement attitudes.

Figure 11



SURVEY OF ELDERLY ATTITUDES

THE BROCKTON AREA TRANSIT STUDY

THE CITY OF BROCKTON IS INTENDING TO APPLY TO THE FEDERAL GOVERNMENT FOR FUNDS TO PURCHASE NEW BUSES FOR THE CITY TRANSIT SERVICE. BUSES BEING CONSIDERED FOR PURCHASE INCLUDE ONES SIMILAR TO THE ONE ON DISPLAY HERE TODAY. TO HELP US IN OUR EVALUATION OF THE ADVISABILITY OF BUYING BUSES OF THIS TYPE WOULD YOU PLEASE ANSWER THE QUESTIONS LISTED BELOW.

WE ALSO HAVE A QUESTIONNAIRE REGARDING BUS SERVICE IN GENERAL. YOUR ANSWERS TO THOSE QUESTIONS WILL HELP US IN PLANNING FOR IMPROVEMENTS IN THE EXISTING BUS SERVICE. THANK YOU FOR YOUR COOPERATION.

THE CITY OF BROCKTON & THE OLD COLONY PLANNING COUNCIL

-
- | | | |
|-----------------------------------------------------------------------------------------------------------------------|---------------|--------------|
| 1. Was the bus easy to board? | Yes <u>70</u> | No <u>2</u> |
| 2. Was there enough leg room between the seats? | Yes <u>67</u> | No <u>5</u> |
| 3. If you were carrying packages would the bus be easy to board? | Yes <u>59</u> | No <u>6</u> |
| 4. Would a space set aside for packages be helpful? | Yes <u>60</u> | No <u>6</u> |
| 5. Are soft (padded) seats very important? | Yes <u>72</u> | No <u>0</u> |
| 6. Does the age, style, condition, or looks of a bus affect your decision to use or not to use public transportation? | Yes <u>52</u> | No <u>21</u> |

Other Comments May Be Placed On The Back Side

ELDERLY SURVEY

A special survey of the elderly was conducted to insure that the needs of this group would be represented in the Tech Study. A questionnaire was developed by combining questions from the LINKS survey form with the rating page from the Mail-Out survey form.

The survey was distributed at the Annual Senior Citizens Picnic held at the Brockton Fair Grounds on August 20, 1974. Distribution took place near a Mercedes-Benz bus which was on display. Several hundred forms were passed out at the picnic.

To insure wide coverage of the elderly, the forms were also distributed from the Senior Citizens Drop-In Center in Brockton and at several elderly housing projects.

A total of 78 elderly survey forms were returned.

Total Summary of ELDERLY SURVEY - 70 Interviews

1. Home Address Brockton
 Street Number _____ Town _____ Zip _____

2. Age Group 9 60-64 15 65-69 16 70-74 31 75 or over

3. Do you own a car or have a car available for you use? 7 Yes 13 No

4. Do you have a handicap which restricts your travel as an:

a. Auto Driver 17 Yes 2 No b. Bus/transit passenger 15 Yes 42 No

Please indicate below where you usually make shopping, medical, and social/recreational trips, how often you make these trips, and your usual means of travel on these trips.

5. SHOPPING TRIPS

Where:	How Many Times a Week					Means of Travel				
	1-2	3-5	Monthly	Rarely		Car	Bus	Walk	Other	Taxi
<u>Westgate</u>	<u>26</u>	<u>2</u>	<u>1</u>	<u>1</u>	46	<u>5</u>	<u>45</u>	<u>4</u>	_____	<u>2</u>
<u>East Side</u>	<u>9</u>	<u>3</u>	<u>2</u>	<u>2</u>	16	<u>2</u>	<u>11</u>	<u>5</u>	<u>1</u>	<u>1</u>
<u>South Side</u>	<u>11</u>	<u>3</u>		<u>2</u>	16	<u>2</u>	<u>13</u>	<u>2</u>	_____	
<u>Downtown Brockton</u>	<u>31</u>	<u>22</u>		<u>1</u>	54	<u>3</u>	<u>37</u>	<u>7</u>	<u>1</u>	<u>1</u>
<u>Other</u> _____	<u>10</u>	<u>3</u>	<u>1</u>		14	<u>3</u>	<u>9</u>	<u>3</u>	_____	<u>1</u>
	97	39	4	6		15	115	21	2	5

6. MEDICAL TRIPS

Where:	How Many Times a Week					Means of Travel				
	1-2	3-5	Monthly	Rarely		Car	Bus	Walk	Other	Taxi
<u>Goddard Medical Area</u>	<u>1</u>	<u>2</u>	<u>2</u>	<u>1</u>	6	<u>3</u>	<u>10</u>	<u>2</u>	<u>1</u>	
<u>Brockton Hospital</u>	<u>3</u>		<u>1</u>	<u>1</u>	5	_____	<u>2</u>	_____	_____	<u>1</u>
<u>Cardinal Cushing Hospital</u>	<u>2</u>				2	_____	<u>5</u>	_____	_____	
<u>Doctor's office in downtown Brockton</u>	<u>12</u>		<u>7</u>	<u>4</u>	31	<u>1</u>	<u>22</u>	<u>5</u>	_____	<u>2</u>
<u>Other</u> _____	<u>3</u>	<u>1</u>	<u>2</u>	<u>4</u>	10	<u>4</u>	<u>7</u>	_____	_____	<u>2</u>
	21	3	12	10		8	52	7	1	5

7. SOCIAL RECREATIONAL TRIPS

Where:	How Many Times a Week					Means of Travel				
	1-2	3-5	Monthly	Rarely		Car	Bus	Walk	Other	Taxi
<u>Drop-in Center</u>	<u>19</u>	<u>2</u>	<u>2</u>	<u>1</u>	31	<u>2</u>	<u>28</u>	<u>9</u>	_____	<u>1</u>
<u>Senior Citizens Center</u>	<u>13</u>	<u>3</u>			16	<u>2</u>	<u>16</u>	<u>4</u>	_____	
<u>Other</u> _____	<u>8</u>	<u>1</u>	<u>1</u>		10	<u>1</u>	<u>9</u>	<u>2</u>	_____	
	40	12	4	1		5	53	15		

8. How do you rate existing bus service: 19 Good 31 Fair 11 Poor

9. With regard to bus/transit service, how important do you rate each of the following factors: (Please mark one choice for each item.)

	Very Important	Fairly Important	Not Important
a. New Buses	<u>28</u>	<u>23</u>	<u>7</u>
b. Benches at most bus stops	<u>44</u>	<u>10</u>	<u>6</u>
c. New Bus Stop signs	<u>43</u>	<u>7</u>	<u>3</u>
d. More frequent service	<u>28</u>	<u>6</u>	<u>2</u>
Rush hour	<u>5</u>	<u> </u>	<u>4</u>
Mid-day	<u>22</u>	<u>7</u>	<u>3</u>
Evening	<u>14</u>	<u>3</u>	<u>5</u>
Weekend	<u>23</u>	<u>5</u>	<u>3</u>
e. Passenger shelters at major stops	<u>39</u>	<u>3</u>	<u>5</u>
f. Air-conditioned buses	<u>19</u>	<u>15</u>	<u>16</u>
g. A bus transit information service	<u>35</u>	<u>5</u>	<u>3</u>
h. Cleaner buses	<u>32</u>	<u>16</u>	<u>3</u>
i. Lower fares	<u>11</u>	<u>12</u>	<u>12</u>
j. Door to door service	<u>25</u>	<u>5</u>	<u>11</u>

10. COMMENTS

See attached page

Please drop your completed survey off at the OCPC booth or mail to:

Old Colony Planning Council
232 Main Street
Brockton, Mass... 02401

Brockton Area Transit Study

Summary of Elderly Survey

<u>General Comments</u>	<u>Number</u>
Dependable, more frequent service needed	10
Drivers helpful and friendly	1
Door-to-door service important for Senior Citizens	1
Senior Citizen reduced fare good	2
Bus shelters needed	2
Good transportation important for city/town	1
 <u>Specific Comments</u>	
Bus needed on Plain Street	1
More buses needed on Kennedy Drive	2
Bus needed on Belair Street	1
Bus needed on Prospect Hill	2
Bus needed on Earle Street to stop at Community Building	3
Should be able to ride to Belmont without an extra fare	1
Bus needed to Westgate Mall for food shopping	2
Like Saturday food shopping bus (Earle St.)	1
Need longer stop light in front of Caffrey Towers to accommodate show walkers safely	1

Brockton Area Transit Study

Specific Comments from Elderly Survey

- Please continue the bus service.
- How about a Kennedy Drive bus for working people at about 4:30 PM.
- How about a Kennedy Drive bus for working people? It's about time you thought of us.
- I think they should have a Senior Citizen Bus from Chatham West at least once a week, as it's far for a 70-year old to walk.
- Let's have a bus on Sundays.
- We need buses on Sundays from 8 AM to 6 PM.
- We need later service to the Mall.
- Buses should run later than 5:30 PM for people returning from Boston.
- I don't go out at night or on holidays because there is no bus to get there.

SPANISH SURVEY

A special survey was also conducted to provide for Tech Study input by the Spanish speaking residents of the region. The questionnaire which had been developed for the elderly was adapted for the Spanish survey by expanding the age range and asking a question about place of employment.

The questionnaire was then translated into Spanish by the staff of the Asociacion San Martin de Porres.

An OCPC staff member explained the Tech Study and survey to a meeting of the Asociacion held on the evening of September 27. The questionnaires were then distributed by Asociacion staff. A total of 13 Spanish survey forms were returned.

Survey of Spanish-Speaking Individuals - 13 Interviews

1. Home Address _____ Street Number _____ Town _____ Zip _____
 2. Age Group 6 60-64 5 65-69 3 70-74 62-69 65 or over
 3. Do you own a car or have a car available for you use? 1 Yes 10 No
 4. Do you have a handicap which restricts your travel as an:
 a. Auto Driver Yes 12 No b. Bus/transit passenger 4 Yes 4 No

Please indicate below where you usually make shopping, medical, and social/recreational trips, how often you make these trips, and your usual means of travel on these trips.

5. SHOPPING TRIPS

SHOPPING TRIPS		How Many Times a Week				Means of Travel			
Where:	1-2	3-5	Monthly	Rarely	Car	Bus	Walk	Other	
Westgate	5	1			2	3	3		
East Side	2			1		1	1		
South Side									
Downtown Brockton	4	2				3	1		
Other		2				1	2		

6. MEDICAL TRIPS.

MEDICAL TRIPS	How Many Times a Week				Means of Travel			
	1-2	3-5	Monthly	Rarely	Car	Bus	Walk	Other
Where : _____								
____ Goddard Medical Area	1	1	3		1	2		1
____ Brockton Hospital	2	1				1	1	
____ Cardinal Cushing Hospital			2	1		2		1
____ Doctor's office in downtown Brockton		2					2	
Other _____								

7. SOCIAL RECREATIONAL TRIPS

<u>SOCIAL RECREATIONAL TRIPS</u>		How Many Times a Week				Means of Travel			
Where:		1-2	3-5	Monthly	Rarely	Car	Bus	Walk	Other
<u>Drop-in Center</u>						—			
<u>Senior Citizens Center</u>						—	—	—	—
<u>Other _____</u>						—	—	—	—

Are you employed? 6 yes 7 No

49

How do you get to work 1 car 2 bus 1 walk

8. How do you rate existing bus service: 1 Good 2 Fair 7 Poor

9. With regard to bus/transit service, how important do you rate each of the following factors: (Please mark one choice for each item.)

	Very Important	Fairly Important	Not Important
a. New Buses	<u>6</u>	<u>3</u>	_____
b. Benches at most bus stops	<u>6</u>	<u>2</u>	_____
c. New Bus Stop signs	<u>6</u>	<u>3</u>	_____
d. More frequent service	_____	_____	_____
Rush hour	<u>5</u>	_____	_____
Mid-day	<u>3</u>	<u>1</u>	_____
Evening	<u>3</u>	<u>1</u>	_____
Weekend	<u>6</u>	<u>1</u>	_____
e. Passenger shelters at major stops	<u>4</u>	<u>4</u>	_____
f. Air-conditioned buses	_____	<u>4</u>	<u>3</u>
g. A bus transit information service	<u>7</u>	<u>1</u>	_____
h. Cleaner buses	<u>6</u>	<u>1</u>	_____
i. Lower fares	<u>6</u>	<u>1</u>	_____
j. Door to door service	<u>6</u>	<u>2</u>	_____

10. COMMENTS

Please drop your completed survey off at the OCPC booth or mail to:

Old Colony Planning Council
232 Main Street
Brockton, Mass. 02401

SPANISH SURVEY COMMENTS

- In this community it is very difficult to transport since no car is available and a taxi costs too much.
- Need bus drivers that speak Spanish. Have no money for translator.
- Difficult to get bus schedule for both Boston and Brockton.
- Transportation is very poor. Have to walk to far to bus stop.
- Bus drivers should speak Spanish.
- Need transportation to jobs.



MASS. Y3. Jcl: 2 B78/2/no 3

SECRET

TECH
MEMO 3

ANALYSIS OF A TRAFFIC STUDY

Technical Memorandum No. 3
TRAFFIC AND LAND-USE ANALYSIS

RECEIVED
JUL 22 1962
U.S. DEPARTMENT OF COMMERCE
BUREAU OF ECONOMIC ANALYSIS

U.S. Census Planning Division

City of Brooklyn

Urban Transportation System Materials, Inc.

Technical Memorandum #3

Financial and Equipment Analysis

Brockton Area Transit Study

Old Colony Planning Council

City of Brockton

Urban Transportation Systems Associates, Inc.

Financial and Equipment Analysis

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Present Operation	11
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Brockton Transportation Authority	17
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Introduction

It is the purpose of this Technical Memorandum to gather together financial and equipment statistics and to perform an initial analysis of that information. This data will be further detailed and analyzed in subsequent tasks and will be presented in more detail in later documents especially the Transit Development Program.

Financial Analysis

History of Bus Service in Brockton (from 11/10/74 meeting)

Prior to the City taking over, there were 16 buses in the fleet - 12 on the road.

After City took over, there were 6 buses in the fleet; now there are 9 buses.

Union Street Railway had very low ridership:

- They grossed approximately \$520. per day over a 3-year period with 30¢ fares.
- Now the system is grossing almost \$500. with a 25¢ regular fare and a 15¢ senior citizen fare.
- Union Street Railway 1972 deficit was approximately \$130,000.
- City deficit for 9/1/73 to 6/30/74 (10 months) was approximately \$75,000.
- Union Street Railway requested a subsidy of \$140,000 plus \$27,000 for senior citizens.

Revenue

Figure 1 displays the revenue for the average day of the week, starting with August 5, 1974, and running to January 31, 1975. This does show an increase in revenue over that period of time.

Figure 2 shows total weekly revenue receipts, and as in Figure 1, shows an overall increase for the period. This increase is not due to increases in the level of service, because basically there have been none. The increase is probably due to the Transit Authority's reacting to the needs of the public with respect to minor changes in routing, the two new mini-buses, and the public's increased need to use transit rather than to spend money on auto travel.

Figure 3 shows the revenue by day of the week.

For service provided by Interstate Coach, the study was able to obtain financial data from the Town of Easton. Easton subsidizes the Interstate operation within the town. Figure 4 displays the number of passengers boarding in Easton.

Revenue for the Average Workday (Monday thru Friday)

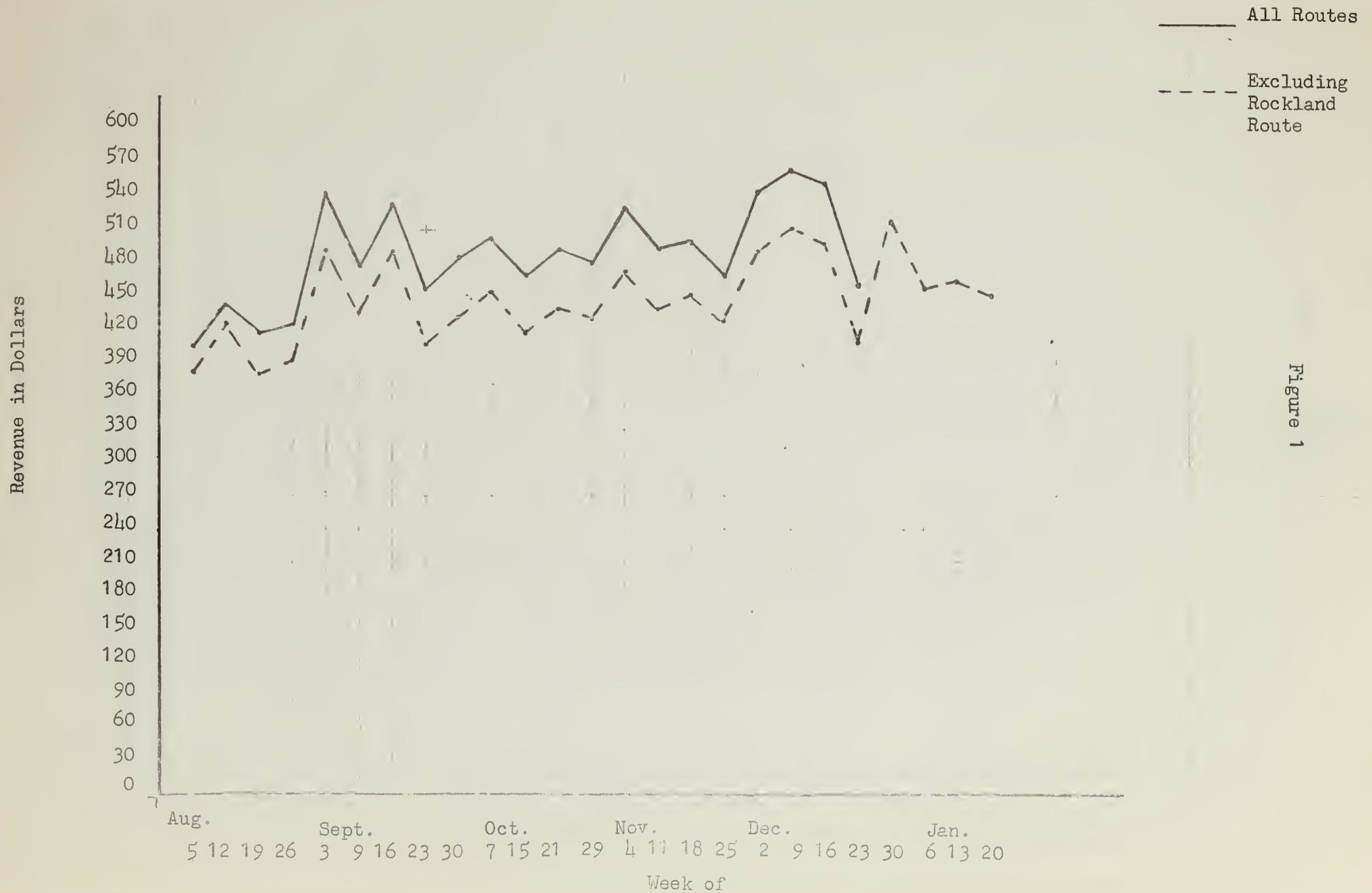
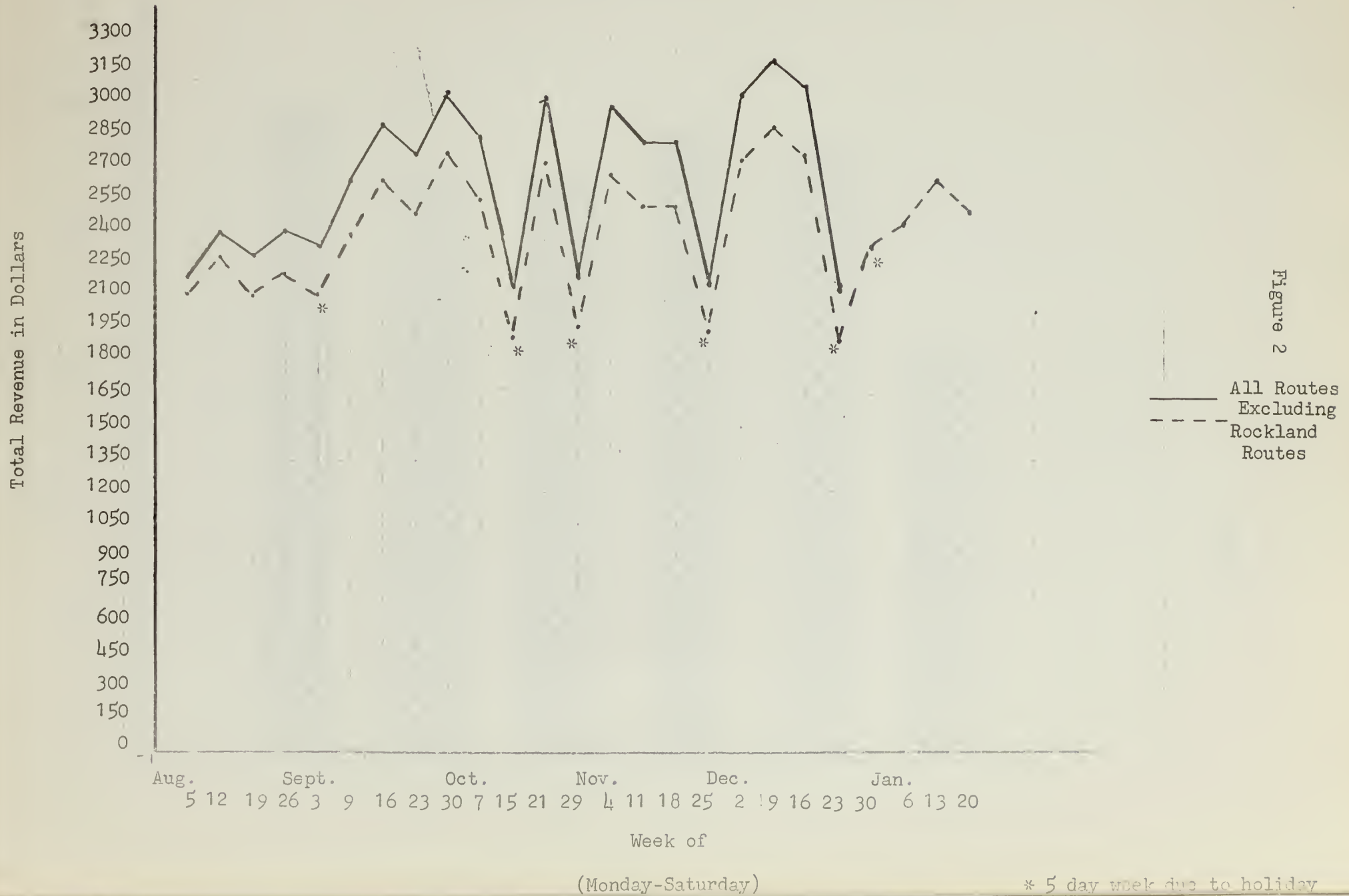


Figure 1

* indicates 1 day week due to holiday

Weekly Receipts



Average Daily Receipts -8/5/74-10/26/74

(Includes Rockland Route)

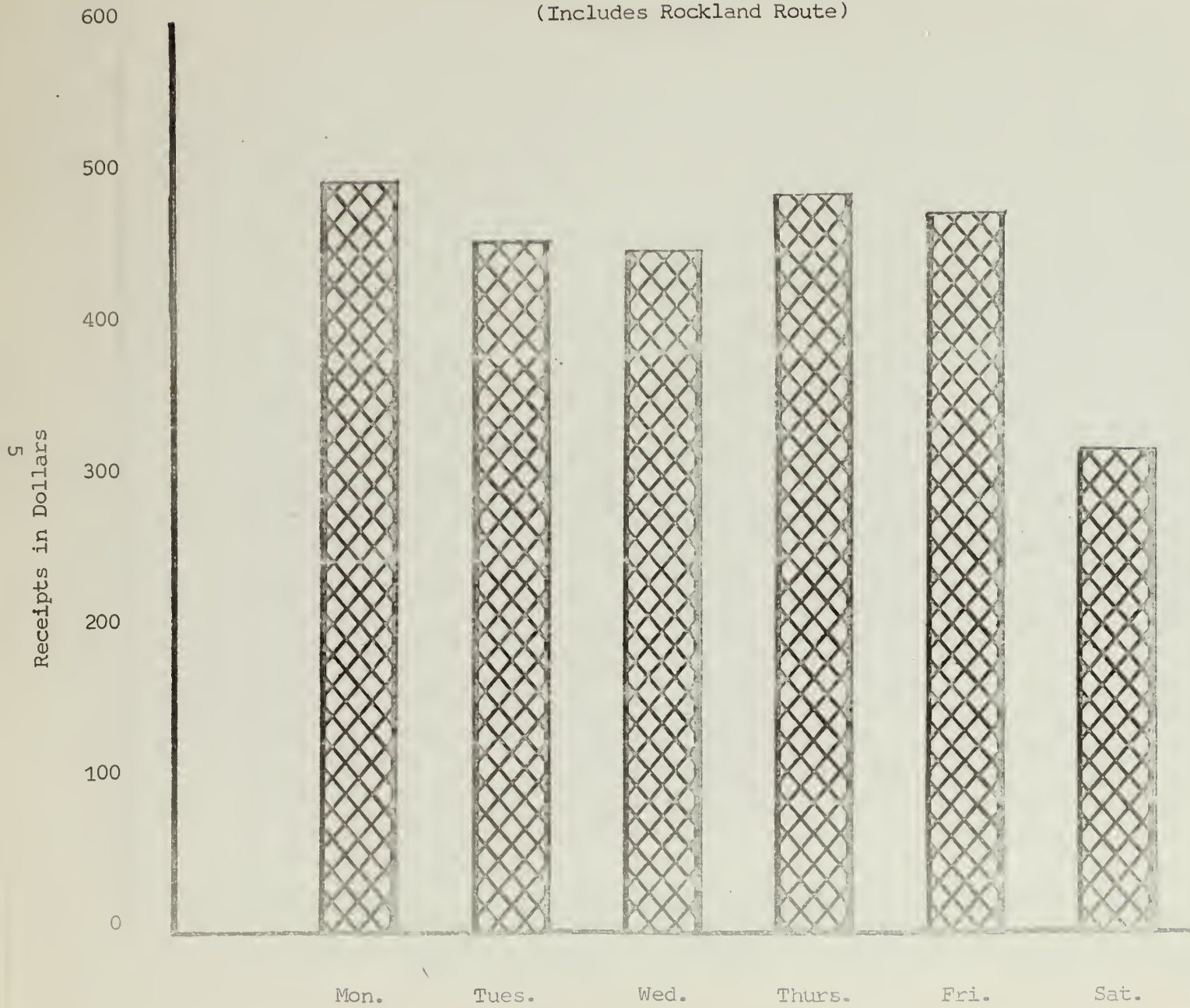
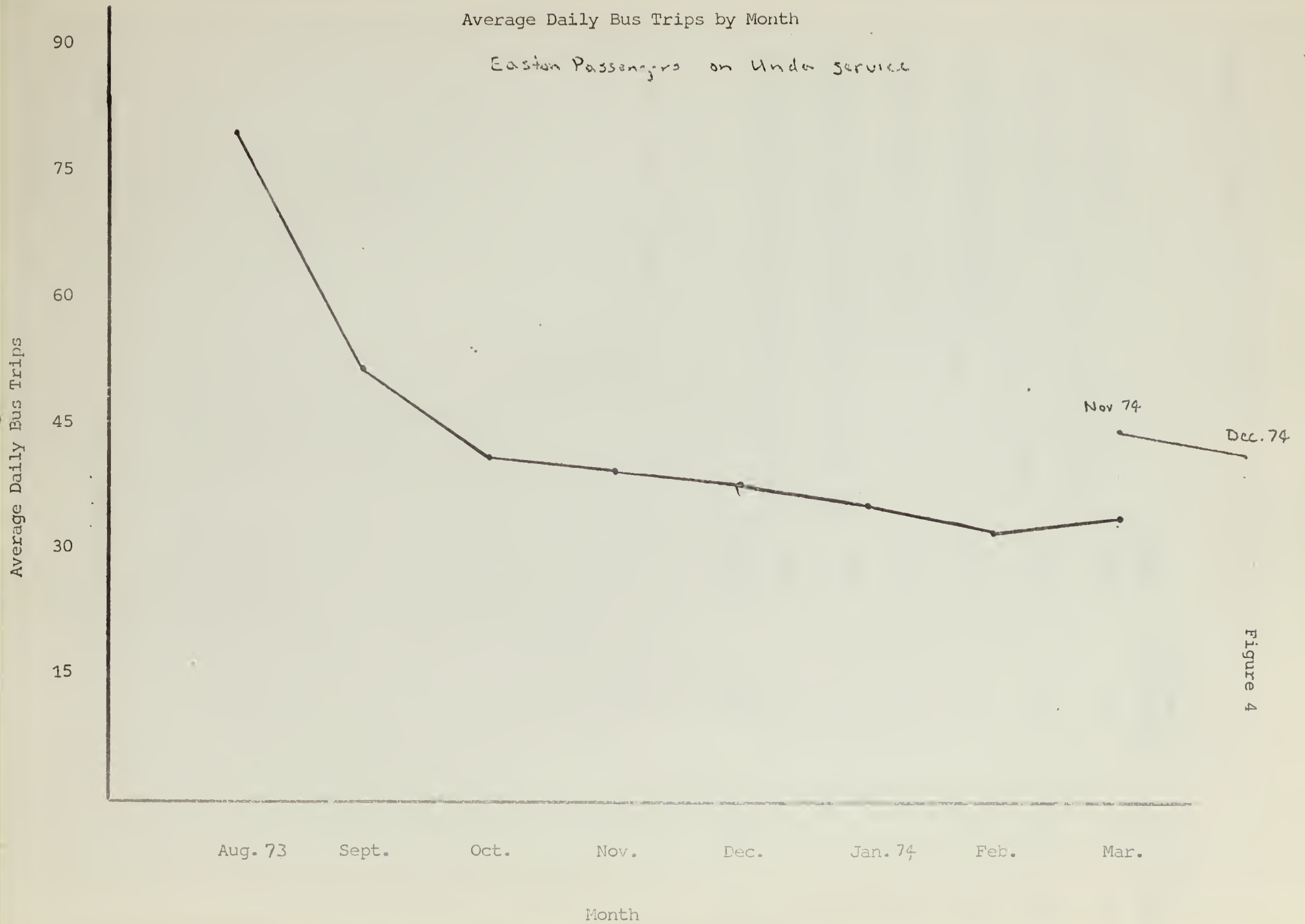


Figure 3



Receipts - Monday, February 3, 1975

	<u>Income</u>	Minimum Number of Riders if <u>All Pay .25¢</u>	<u>Riders at</u> <u>23.6¢</u>	<u>21.5¢</u>
Ames and Perkins \$28.25 in 25¢ = 113 minimum full pay riders	\$ 43.30	173	183	201
Crescent and Center \$59.00 in 25¢ = 236 minimum full pay riders	81.55	325	346	379
Grafton and Ashland Heights \$11.75 - 25¢ = 47 minimum riders	11.75	47	50	55
Senior Citizens \$10.00 - 15¢ = 66 riders	10.00	66 ¹	66	66
Belmont and Pleasant \$121.50 in 25¢ = 486 minimum full pay riders	148.20	593	627	689
Montello and Campello \$131.25 in 25¢ = 525 minimum full pay riders	188.20	753	797	875
	<u>\$ 483.00</u>	<u>1957</u>	<u>2069</u>	<u>2265</u>

1 Exact number of riders

Crocker Transit Company Ridership

October 22, 1974 Survey

T.A. Regular Routes	1754
Rockland	73
Student Tripper	372
Senior Citizen Run	<u>45</u>
	2244

Revenue

	<u>October 22, 1974</u>	<u>February 3, 1975</u>
Total Income	\$ 478.00	
Transit Authority	414.65	\$ 483.00
Tickets	12.00	
Rockland	51.35	
Ridership excluding Rockland	1754	2046

On-Board Statistics

8% were school = 146

26% were over 64 years of age = 475
34%

Average Fare = 34% (15¢) + 66% (25¢) = 21.5¢

Transit Authority Service Analysis for December 1974, January 1975

(Data does not include school tickets)

Average Monthly Revenue for December 1974-January 1975 \$ 10661.

Average Monthly Revenue for September, October, November 1974 9617.

Total Revenue December 1974-January 1975 \$21324.45

Total Weekday Revenue 19202.95

Average Weekday Revenue (44 days) 436.43

Total Saturday Revenue 2121.50

Average Saturday Revenue (8 days) 265.18

Average Daily Riders at 21.5¢ average fare

Weekdays 2030

Saturday 1233

Bus Miles of Service (TA only)

Average Weekday 1240.3

Average Saturday 542.0

Total Bus Miles of Operation

Weekday - 1240.3 miles x 44 days = 54573.2 miles

Saturday - 542 miles x 8 days = 4336.0

Total - 58909.2

Revenue per bus mile of service:

$$\frac{\$21324.45}{58909.2 \text{ miles}} = .3620$$

Subsidy per bus mile of service:

$$\frac{\$18600}{58909.2 \text{ miles}} = .3157$$

Other City costs:

$$\frac{\text{Ins. and fuel}}{58909.2 \text{ miles}} = \frac{\$2880 + 7000}{58909.2} = \frac{0.1677}{0.846/\text{bus miles}}$$

Costs per passenger served (excludes school trippers)

Total Passengers

$$\frac{\$21324.45 \text{ (rev.)}}{21.5\text{¢ (avg.fare)}} = 99100 \text{ passengers}$$

Total Cost for Service:

$$\frac{\text{Revenue} + \text{Subsidy} + \text{Other City Costs}}{\text{Passenger}} = \frac{\$49804}{99100} = \$0.502$$

Annual Hours of Operation (TA only-excluding school)

303,52.4 hours

Dec. 74, -Jan. 75 Hours 5095.2

Total cost of service

$$\frac{\$49,804.}{5,095.2} = \$9.77$$

Projected Budget

BROCKTON TRANSIT AUTHORITY

December 1, 1974 - June 30, 1975

Outlays

Subsidy: To Crocker Transportation Services, Inc.

9,300/month @ 7 months = \$ 65,100.00

Insurance: Bodily injury, property damage, fire
and theft.

yearly premium, 1/75 - 12/75 17,284.33

December 74 premium 1,440.36

Fuel: 7 months @ 3,500/month = 24,500.00

Projected gross outlays \$108,324.69

Anticipated Income

Insurance policy rebate

6 months 8,642.17

State aid (ch. 1141) 49,841.26

Net cost to City \$ 49,841.26

Net Monthly Cost to City \$7,120.00

Crocker Transit Company Contract Prior to December 1, 1974

City Pays

Fuel

Repairs

Capital - buses, tires, fare boxes

for \$71,000 for 10 months.

Crocker pays out of fare boxes

Labor

Management

Overhead

Storage

Routine maintenance

New Contract Starting December 1, 1974

Council order to sell equipment to Authority

Crocker request license

Authority to contract with Crocker

Important Dates

January 1, 1973 to September , 1973 - operator strike

September 1, 1973 City took over service (bought out Union Street)

to November 30, 1974 - Contract with Crocker

- Transit Authority formed

New Contract for December 1, 1974 to July 1, 1975

City to pay Crocker \$80,000

\$47,600 = \$6800/month fuel and repairs

21,000 = fuel

10,000 = insurance (none before because city insured itself)

Current Monthly Costs - Brockton Transit System

December 1974

Costs¹

Driver labor ²	\$13,606	
Clerical	600	
Storage and Cleaning	<u>1,000</u>	
	\$15,206	
Overhead (management, office, auditing)	<u>1,521</u>	
TOTAL Monthly Costs	\$16,727	\$16,727

Revenue

Average monthly fairbox revenue	<u>\$10,000</u>
Monthly deficit	\$ 6,727

Costs Paid by City

Monthly subsidy	\$ 6,800
Fuel	3,500
Maintenance	<u>3,000</u>
NET Monthly Cost to City	<u>\$13,300</u>

¹These costs are paid by Crocker.

²Driver costs based on 16 men at \$4.12/hr. plus 20% for fringe and overhead.

Ridership Per Bus Mile

Average Weekday

Route	Miles of Bus Operation			Riders Survey		Riders/ Total Miles	
	In Service	Dead Head	Total	Oct. 74	Feb. 75	Oct. 74	Feb. 75
Montello/Campello	255.4	2.6	258.0	680	797	2.6	3.1
Centre/Crescent	223.6	2.6	226.2	341	346	1.5	1.5
Pleasant/Belmont	245.3	5.0	250.3	489	627	2.0	2.5
Perkins/Ames	362.3	5.1	367.4	296	183	0.8	0.5
Copeland/Ashland	103.9	5.2	109.1	169	50	1.6	0.5
Brockton/Rockland	187.0	1.0	188.0	73	80	0.4	0.4
Senior Citizen	15.8	0.0	<u>15.8</u>	<u>45</u>	<u>66</u>	<u>2.8</u>	<u>4.2</u>
			1414.8	2093	2149	1.4	1.5
Easton/Brockton (Unda)	136.7			74		0.5	
Stoughton/Brockton (Unda)	<u>129.0</u>			<u>108</u>		<u>0.8</u>	
	265.7			178		0.7	

Excludes school trip miles and riders

Interstate Coach Company Easton/Brockton Route

Statistics for November and December 1974 for that part of the service provided within the Town of Easton:

Total Ridership	2169
Total Subsidy	\$ 2456.00
Total Revenue	<u>1075.25</u>
Total Income	\$ 3531.25

Average fare per passenger \$ 0.50

Subsidy per passenger 1.13

Cost per passenger \$ 1.63

Daily revenue miles in Easton 71.0

Total miles of service for November and December

50 days x 71.0 miles/day = 3550 miles

Per mile cost of revenue service = \$0.99

Passengers per revenue mile = 61

Summary of Contract Between the Town of Easton and Unda's Bus Service, Inc.
to Provide Fixed Route Service in the Town of Easton

1. Carrier shall furnish public transportation daily except Sundays and legal holidays in the Town of Easton and between the Town of Easton and the City of Brockton with a minimum of 6 round trips daily.

2. The contract period is from July 1, 1974 to June 30, 1975.

3. Amount of money

- will not exceed \$52 for any day of operation, and
- will not exceed \$14,987.50 total.

4. Determination of amount of money:

The carrier requires a minimum daily revenue of \$72 and the Town will make up the difference, not to exceed \$52 per day.

5. Insurance

The carrier carries motor vehicle liability insurance on each bus in the amount of \$25,000 per person, \$100,000 per accident, and \$10,000 property damage insurance per accident.

6. The carrier furnishes buses to meet minimum safety standards required by the Commonwealth.

7. Fare Structure

- If an individual gets on and off within the Town of Easton, the fare is \$.30.
- If an individual gets on in Easton and gets off in Brockton, the fare is \$.50.
- If a passenger gets on in Brockton and gets off in Easton, the fare is \$.50. However, this passenger is not considered in the passenger count for Easton, and therefore his revenue is not discounted against the Easton subsidy.

Equipment Analysis

Brockton Transportation Authority and Crocker Transportation Services, Inc.

Garage Facility

The present bus garage and storage facility is leased by Crocker for \$1500. per month. The garage is brick with an inside truss roof with offices on the front of the facility (not leased by Crocker). The garage itself is 12,800 square feet, and will accommodate 15 large buses. The garage is used for repairs and cleaning and contains small vehicle floor lifts. The paved yard adjacent to the garage contains 16,000 square feet and will store 25 large buses. Crocker recently considered purchasing the entire facility for approximately \$300,000.

Maintenance Equipment

Cleaning

The operator has a engine steam cleaning machine and cleans the engines of his own buses and the transportation authority buses about once a month, required because of all of the dirt that is accumulated from the operation. A new steam cleaning machine will cost approximately \$700.

The operator presently washes each bus about twice a week with a high-pressure hose washer and suggests that the transportation authority consider an indoor drive-through washer for approximately \$17,000.

The operator presently has a vacuum machine for the interiors of the vehicles and recommends that a new vacuum be purchased.

Bus Repair

The operator presently has three small-bus floor lifts and would prefer to have a pit for repairs, however by State statute, pits are illegal in his type of operation. He recommends that two large-bus floor lifts be purchased and installed for approximately \$15000. each.

Consideration should be given to the possibility of purchasing machinery to turn brake drums and to retread tires.

Parts Inventory

The operator estimates that new buses would require an inventory of standard parts for about \$10,000.

Heaters

For those vehicles held outside in colder weather, there is a need for engine plug-in heaters at a cost of \$300. apiece.

Coin Machines

The purchase of a coin-counting and wrapping machine would speed up office work and the cost would be approximately \$1,000.

Rolling Stock

Buses owned by the Brockton Transportation Authority and leased to Crocker Transit Systems, Inc.

November 4, 1974

Leased Equipment

<u>Bus Number</u>	<u>Manufacturer</u>	<u>Year</u>	<u>Model</u>	<u>Serial Number</u>	<u>Number of Seats</u>
7401	Flxible	1974	572KE-F74-19	FX-614	23
7402	Flxible	1974	572KE-F74-19	FX-622	23
475	GMC	1962	TDH4517	1748	44
476	GMC	1962	TDH4517	1749	44
478	GMC	1962	TDH4517	1751	44
479	GMC	1962	TDH4517	1752	44
	GMC	1955	TDH5105	1290	51
	GMC	1955	TDH5105	1297	51
	GMC	1955	TDH5105	1298	51

Interstate Coach Company

The Interstate Coach Company operates service from Stoughton Center to Brockton Center through Westgate Mall and from Easton to Brockton. The Easton to Brockton run is subsidized by the Town of Easton. The company uses a fare box with a meter and records the fares when it crosses the Brockton-Easton town line in each direction. The company uses those passenger counts to bill the Town of Easton.

Interstate Coach uses locked, exact-fare boxes on the Stoughton run.

Garage Facilities

The company garage is located in Stoughton Center and contains eight bus bays. The bus bays are large enough to store one large coach or two 22-seat coaches. The garage is equipped with a repair pit.

Rolling Stock

The company runs only the two local routes previously mentioned. The rolling stock used in the operation is:

<u>Use</u>	<u>No.</u>	<u>Year</u>	<u>Make</u>	<u>Type</u>	<u>Seats</u>
Easton	1	1972	Carpenter	Gas	22
Stoughton	1	1973	GM Transit	Diesel	33
Backup	1	1961	GMC	Diesel	41
Backup	1	1951	GMC	Diesel	45



MASS. V3. 0-1: 2B78/2/no. 21

1320-10-1175

TECH

MEMO

4

EXERCISE AREA TRANSIT STUDY

EXERCISE AREA TRANSIT STUDY

JUL 23 1960

Technical Memorandum No. 1
SEGMENTAL DEVELOPMENT PLAN

U.S. AIR FORCE MILITARY BOARD

1115 N. BRADLEY

ARMED TRANSPORTATION SYSTEMS, INC.

BROCKTON AREA TRANSIT STUDY

SEQUENTIAL DEVELOPMENT PLAN

(Year 1 - Year 5 Improvements)

May, 1975

Old Colony Planning Council

City of Brockton

Urban Transportation Systems Associates, Inc.

I. Introduction

In the process of conducting the Brockton Area Transit Study, a detailed investigation was made of the present bus systems in the region and the quality of service was examined. In addition, some generalizations were made concerning the steps that could, or possibly should have been taken to encourage ridership in the system which presently exists.

As the study continued, a variety of alternative fifth-year development plans were considered and a number of them discussed and analyzed in detail. The study Steering Committee, JTC, and the Council finally adopted one of the alternatives (commonly referred to as 1B, Radial Fixed Route Service) which is now being used in this analysis to develop an improvement plan for each of the five years.

This sequential plan points out in detail the improvements that should be made to the system for each of the five years. Primarily, it addresses the capital improvements which should be made, but in addition, it also addresses non-capital improvements such as information and promotion programs which are so important to the success of the system.

It is important to realize that any of the improvements which are made, such as the initiation of bus service in a corridor where it has not existed, or the improvement of frequency on an existing line from 30 minutes to 15 minutes is, in fact, a test. That is, an effort has been made to predict the results of that improvement, but these estimates are not made with hard, pure scientific data. Therefore the actual implementation of the improvement must be continually monitored and revisions must be made to the plan periodically. This sequential plan with its recommended improvements on a yearly basis, will require continual review, update and modification. To work on that effort, OCPC is including in its next Unified Transportation Work Program a task to monitor the improvement program.

General Comments Concerning Sequential Plan

First Year

City of Brockton is the only member of the Transit Authority, therefore:

- Substantially improve fixed route service in Brockton to
15-minute frequency all day on 6 primary routes,
15-minute frequency in peak periods, and 30-minute
frequency in off-peak periods on 4 secondary routes.
30-minute frequency all day on 3 secondary routes.
- Purchase and install other necessary equipment.
- Conduct extensive promotional program.
- Initiate information system.
- Revise fare structure, passes, coupons, free elderly service.
- Purchase land and construct downtown terminal.

Second Year

- Extend fixed route service to Avon, Easton, and Stoughton at 30 minute frequency.
- Provide demand-responsive service for elderly and clients of needy agencies in Brockton (agencies to underwrite service).
- Replace four 1962 buses.

Third Year

- Extend fixed route service to Whitman, Bridgewater, and West Bridgewater at 30-minute frequency.
- Provide demand-responsive service to Avon, Easton, and Stoughton if these communities desire service.

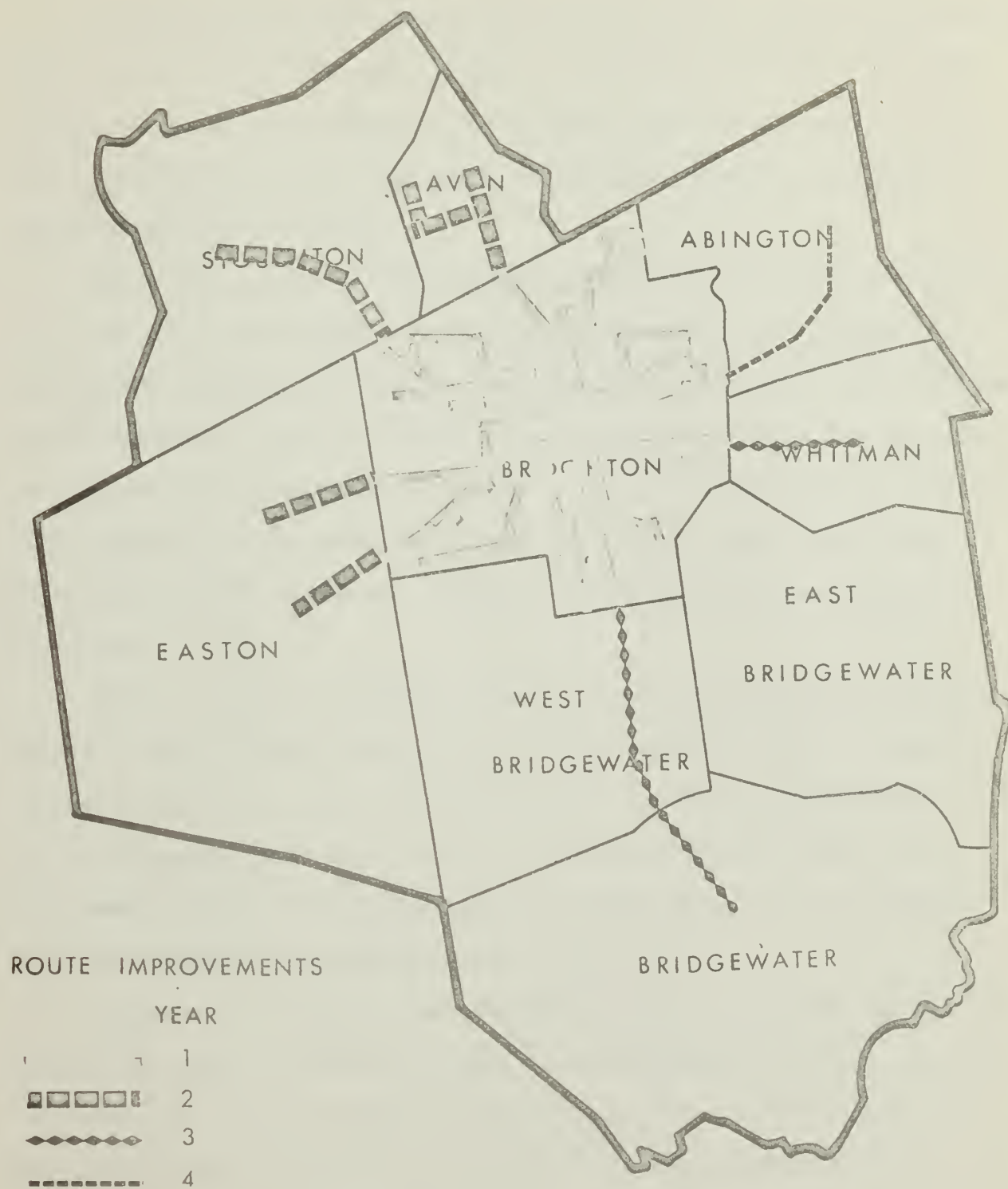
Fourth Year

- Extend fixed route service to Abington with 30-minute frequency.
- Provide demand-responsive service to Whitman, Bridgewater, and West Bridgewater.

Fifth Year

- Replace two 1974 small buses.
- Add demand-responsive service to Abington.

FIVE YEAR SEQUENTIAL PLAN



In the process of developing the sequential plan for the five-year period after the alternatives had been adopted by the Steering Committee, the staff thought it appropriate to separate the equipment and financial needs for the fixed route service from the equipment and financial needs of the demand-responsive phase of the plan.

The primary reason for this separation was the attitude on the part of the staff that the local communities reviewing the recommendations would be most concerned in looking at the financial requirements of each phase of the recommendations separately. That is, the staff would prefer to look at the costs for fixed route service separately from those of the demand-responsive service and if it wished to see the total cost to each community, it would only have to add the two services together. Therefore, the following tables separate the two phases.

Table 1 shows the equipment needs for fixed route and demand-responsive service. The fixed route needs are in the left-hand column and the demand responsive needs are in the right-hand column. Further, the table breaks down the equipment needs by year over the five-year period. Table 2 is a cost summary of the capital improvements for fixed route service and Table 3 is the cost summary for demand-responsive service.

Although it has been recommended that the demand-responsive service and equipment be owned and operated through the Transportation Authority, the staff has recommended that the demand-responsive buses serve as feeder buses to the fixed route service and that the buses be housed in the town sponsoring the bus. However, the bus would be serviced and maintained by the Transportation Authority at its storage and maintenance facility.

Table 1

Sequential Capital Improvement Program

Fixed Route System		Demand-Responsive System	
		FIRST YEAR	
Buses			
Brockton			
6 routes - 2 each	12 lg buses		
4 routes - 2 each	8 sm buses		
3 routes - 1 each	3 sm buses		
	<u>23</u> buses		
Spare buses	2 flexettes		
	<u>4</u> 1962's		
	29 buses		
		No First Year Recommendations	
Service Vehicle - 3/4 ton truck	1		
Two-way Radios	30		
Bus Stop Signs	400		
Shelters	10		
Benches	20		
Maintenance Equipment			
		SECOND YEAR	
Buses			
Easton-30 min frequency	2 sm buses		
Avon-30min frequency	1 sm bus		
Stoughton-30min freq.	1 sm bus	Buses (with lifts)	
Replace spare buses 1962's	4 sm buses	Brockton	2 sm buses
Locked boxes	4	Locked boxes	2
Radios	4	Radios	2
Bus Stop Signs	196		
Easton - 82			
Avon - 57			
Stoughton - 57			
Shelters	8		
Benches	5		

Table 1 (Cont.)

Sequential Capital Improvement Program

Fixed Route System		Demand-Responsive System	
<u>THIRD YEAR</u>			
Buses		Buses (with lifts)	
Whitman-30 min frequency	1 sm bus	Easton	1 sm bus
Bridgewater-30 min freq	1 sm bus	Avon	1 sm bus
W. Bridgewater-30 min freq	1 sm bus	Stoughton	1 sm bus
Locked boxes	3	Locked boxes	3
Radios	3	Radios	3
Bus Stop Signs	156		
Whitman - 64			
Bridgewater - 62			
W. Bridgewater - 30			
Shelters	10		
Benches	5		
<u>FOURTH YEAR</u>			
Buses		Buses (with lifts)	
Abington-30 min frequency	1 sm bus	Whitman	1 sm bus
Locked boxes	1	Bridgewater	1 sm bus
Radio	1	W. Bridgewater	1 sm bus
Bus Stop Signs	65	Locked boxes	3
Shelters	2	Radios	3
Benches	6		
<u>FIFTH YEAR</u>			
Buses		Buses (with lifts)	
Replace 2 '74 flexettes	2 sm buses	Abington	1 sm bus
Service Vehicle - Replace truck		Locked bus	1
		Radio	1

Table 2

Capital Improvement Program Summary
Fixed Route
(1975 Dollars)

Item	Program Year									
	First Year		Second Year		Third Year		Fourth Year		Fifth Year	
	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
Buses										
35-45 Passenger @ \$60,000	12	\$720,000								
20-25 Passenger @ 25,000	11	275,000	8	\$200,000	3	\$75,000	1	\$25,000	2	\$50,000
Service Trucks @ 7,500	1	7,500							1	7,500
Supervisory Cars										
Communications Equipment										
Transceivers @ 6,000	1	6,000								
Mobile Units @ 1,200	30	36,000	4	4,800	3	3,600	1	1,200		
Passenger Shelters @ 2,400	10	24,000	8	19,200	10	24,000	2	4,800		
Bus Stop Signs @ 50	400	20,000	196	9,800	156	7,800	65	3,250		
Benches @ 150	20	3,000	5	750	5	750	6	900		
Fare Collection Equipment										
Boxes @ 1,400	30	42,000	4	5,600	3	4,200	1	1,400		
Counters @ 3,000	1	3,000								
Garage										
Building Acquisition				325,000						
Equipment		27,800								
Passenger Terminal		250,000								
Contingency 10%		141,430		56,515		11,535		3,655		5,750
Total		\$1,555,730		\$621,665		\$126,885		\$40,205		\$63,350

Table 3

Capital Improvement Program Summary
Demand-Responsive
(1975 Dollars)

Item	Program Year									
	First Year		Second Year		Third Year		Fourth Year		Fifth Year	
	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
Buses										
15-25 Passenger										
With Lifts @ \$30,000			2	\$60,000	3	\$90,000	3	\$90,000	1	\$30,000
Service Trucks										
Supervisory Cars										
Communications Equipment										
Transceivers										
Mobile Units @ \$1,200			2	2,400	3	3,600	3	3,600	1	1,200
Passenger Shelters										
Bus Stop Signs										
Benches										
Fare Collection Equipment										
Boxes @ \$300										
Counters			2	600	3	900	3	900	1	300
Garage										
Building Acquisition										
Equipment										
Passenger Terminal										
Contingency 10%				6,300		9,450		9,450		3,150
Total		0		\$69,300		\$103,950		\$103,950		\$34,650

Table 4

Sequential Plan Operating Statistics
Years 1 Through 5

Excludes Demand-Responsive Service

Year	1	2	3	4	5
Weekday Route Miles	78.3	105.5	121.1	127.6	127.6
Daily Revenue Miles	3,344.4	4,105.8	4,542.8	4,724.8	4,724.8
Annual Revenue Miles	923,054.4	1,133,200.8	1,253,812.8	1,304,044.8	1,304,044.8
Number of Buses in Operation ¹	23	27	30	31	31
Small	11	15	18	19	19
Large	12	12	12	12	12
Annual Hours of Operation	78,936	94,392	102,120	105,984	105,984
Assumed Ridership					
Average Weekday	5,143	6,045	6,638	6,997	7,175
Annual	1,419,468	1,668,420	1,832,088	1,931,172	1,980,300
Weekday					
Productivity Factor	1.54	1.47	1.46	1.48	1.52
Annual Operating Cost	\$789,360	\$937,460	\$1,071,460	\$1,127,360	\$1,127,360
Administrative Cost	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Bonding	\$82,500	\$82,500	\$82,500	\$82,500	\$82,500
Total Annual Costs	\$921,860	\$1,069,960	\$1,203,960	\$1,259,860	\$1,259,860
Annual Revenue	\$283,894	\$333,684	\$366,418	\$386,234	\$396,060
Deficit (Total) ²	\$637,966	\$736,276	\$837,542	\$873,626	\$863,800
Total Deficit					
Suburban Towns	0				\$249,200
Suburban Share					
50% State 50% Local	0				\$124,600
Suburban Share 25% Local					
50% Federal 25% State	0				\$62,300
Total Deficit					
Brockton	\$637,966				\$614,600
Brockton Share					
50% State 50% Local	\$318,983				\$307,300
Brockton Share 25% Local					
50% Federal 25% State	\$159,492				\$153,650

1 Excludes spares

2 Total deficit to be funded from a number of sources

Table 5

Demand-Responsive Costs - By Town

Year 5

	Brockton	Avon	Abington	Easton	Bridgewater	W. Bridg.	Stoughton	Whitman
Average Weekday Bus Hours	28.	14	14	14	14	14	14	14
Average Saturday Bus Hours	14	7	7	7	7	7	7	7
Annual Bus Hours	7,600	3,800	3,800	3,800	3,800	3,800	3,800	3,800
Average Fair	.35	.35	.35	.35	.35	.35	.35	.35
Assumed Origins/Hour	15	8	7	7	7	6	8	7
Assumed Annual Ridership	114,000	30,400	26,600	26,600	26,600	22,800	30,400	26,600
Annual Revenue	\$39,900	\$10,600	\$9,300	\$9,300	\$9,300	\$8,000	\$10,600	\$9,300
Annual Operating Cost (\$11.50/Hr.)	\$87,400	\$43,700	\$43,700	\$43,700	\$43,700	\$43,700	\$43,700	\$43,700
Annual Deficit	\$47,500	\$33,100	\$34,400	\$34,400	\$34,400	\$35,700	\$33,100	\$34,400
Town Share 25%	\$11,900	\$8,300*	\$8,600*	\$8,600*	\$8,600*	\$8,900*	\$8,300*	\$8,600*

*Federal funds may not be available for demand-responsive service outside of the urban area unless fixed route service connects it to the urban area

Table 6

ESTIMATED PROJECT BUDGET

1. Purchase of 12 new 33 passenger buses	\$720,000
2. Purchase of 11 new 19 passenger buses	259,600
3. Purchase and installation of a two-way radio communication system	32,000
4. Purchase of 30 new fareboxes	39,725
5. Purchase of 20 new bus stop benches	3,000
6. Purchase of 10 new bus shelters	24,000
7. Purchase of 400 new bus stop signs	8,000
8. Purchase and installation of 150 sign posts	12,000
9. Purchase of one 3/4 ton service truck	7,850
10. Purchase of one new steam cleaner	700
11. Purchase of one new portable bus washer	5,000
12. Purchase of one new vacuum cleaner	700
13. Purchase of one new coin counter	2,700
14. Purchase of metric tools	1,700
15. Purchase of spare engines and transmissions	15,400
16. Purchase of office equipment	4,300
17. Design and construction of downtown terminal	73,140
18. Installation of 10 bus shelters	2,500
19. Purchase of land for downtown bus terminal	170,350
20. Administration, specifications, advertising, etc.	20,000
	<u>\$1,402,665</u>
Federal Share \$1,234,345	
Local Share \$ 308,586	10%
	<u>140,266</u>
	<u><u>\$1,542,931</u></u>

